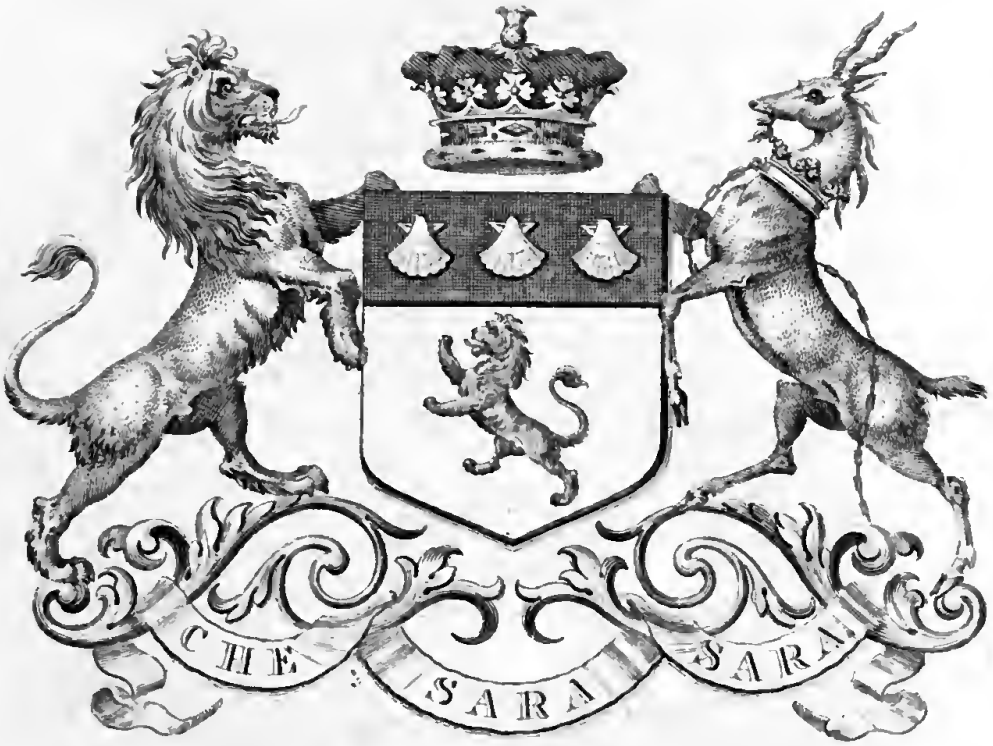


# William, Duke of Bedford,

## Endsleigh.

# POCKET

# ENCYCLOPEDIA.

VOL. II.

# ПОСЕТИТЕЛЬ

## МУЗЕЯ.

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VOL. II.

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# POCKET ENCYCLOPEDIA

OR A

# DICTIONARY

OF

## ARTS, SCIENCES,

AND

## POLITE LITERATURE

*COMPILED FROM THE BEST AUTHORITIES*

BY

EDWARD AUGUSTUS KENDAL.

*Embellished with Copper Plates designed and engraved by EMINENT ARTISTS.*

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## COLD.

Cold, in a relative sense, signifies the sensation which accompanies a transition of the fine vessels of the human body from an expanded to a more contracted state. In an absolute sense, it signifies the cause of that transition; or, in general, the cause of the contraction of every substance, whether solid or fluid, in nature. Great degrees of cold are produced by mixing together substances which dissolve rapidly. The reason of this will appear when it is recollected that in the conversion of solid bodies into fluids caloric is always absorbed. Mixtures to produce artificial cold are generally made of neutral Salts (which see) and of snow: or of neutral salts, diluted acids, and powdered ice or fine flaky snow. The following tables given to the public by Mr. Richard Walker of Oxford will exhibit at once all that is important on this subject.

In order to produce these effects, the salts employed must be fresh crystallized, and newly reduced to very fine powder. The vessels in which the freezing mixture is made should be very thin, and just large enough to hold it, and the materials should be mixed together as quickly as possible. To produce the very low degrees of cold, the materials in the first column are to be cooled previously to mixing, to the temperature required, by mixtures taken from either of the following tables. This observation chiefly applies to the third table.

TABLE I.—This Table consists of FRIGORIFIC MIXTURES, which are sufficient for all useful and philosophical purposes, in any part of the world, at any season.

## FRIGORIFIC MIXTURES, *without Ice.*

| MIXTURES. | | Thermometer sinks. | Deg. of cold. |
|---|---|---|---|
| | *parts* | | |
| Muriate of ammonia... | 5 | | |
| Nitrate of potash ..... | 5 | From + 50° to + 10°. | 40 |
| Water ..... | 16 | | |
| Muriate of ammonia... | 5 | | |
| Nitrate of potash ..... | 5 | From + 50° to 4°. | 46 |
| Sulphate of soda ..... | 8 | | |
| Water ..... | 16 | | |
| Nitrate of ammonia ... | 1 | From + 50° to + 4°. | 46 |
| Water ..... | 1 | | |
| Nitrate of ammonia ... | 1 | | |
| Carbonate of soda ..... | 1 | From + 50° to — 7°. | 57 |
| Water ..... | 1 | | |
| Sulphate of soda ..... | 3 | From + 50° to — 3°. | 53 |
| Diluted nitric acid ... | 2 | | |
| Sulphate of soda ..... | 6 | | |
| Muriate of ammonia... | 4 | From + 50° to — 10°. | 60 |
| Nitrate of potash ..... | 2 | | |
| Diluted nitric acid ... | 4 | | |
| Sulphate of soda ..... | 6 | | |
| Nitrate of ammonia ... | 5 | From + 50° to — 14°. | 64 |
| Diluted nitric acid ... | 4 | | |
| Phosphate of soda..... | 9 | From + 50° to — 12°. | 62 |
| Diluted nitric acid ... | 4 | | |
| Phosphate of soda..... | 9 | | |
| Nitrate of ammonia ... | 6 | From + 50° to — 21°. | 71 |
| Diluted nitric acid ... | 4 | | |
| Sulphate of soda ..... | 8 | From + 50° to 0°. | 50 |
| Muriatic acid ..... | 5 | | |
| Sulphate of soda ..... | 5 | From + 50° to + 3°. | 47 |
| Diluted sulphuric acid | 4 | | |

TABLE II.—This Table consists of FRIGORIFIC MIXTURES, composed of *ice*, with chemical salts and acids.

## FRIGORIFIC MIXTURES, *with Ice.*

| MIXTURES. | | Thermometer sinks. | Deg. of cold. |
|---|---|---|---|
| | *parts* | | |
| Snow, or pounded ice | 2 | *From any Temperature* to —5° | — |
| Muriate of soda | 1 | | |
| Snow, or pounded ice | 5 | to —12° | — |
| Muriate of soda | 2 | | |
| Muriate of ammonia | 1 | | |
| Snow, or pounded ice | 24 | to - 18° | — |
| Muriate of soda | 10 | | |
| Muriate of ammonia | 5 | | |
| Nitrate of potash | 5 | | |
| Snow, or pounded ice | 12 | to —25° | — |
| Muriate of soda | 5 | | |
| Nitrate of ammonia | 5 | | |
| Snow | 3 | From + 32° to — 23° | 55 |
| Diluted sulphuric acid | 2 | | |
| Snow | 8 | From + 32° to — 27° | 59 |
| Muriatic acid | 5 | | |
| Snow | 7 | From + 32° to — 30° | 62 |
| Diluted nitric acid | 4 | | |
| Snow | 4 | From + 32° to — 40° | 72 |
| Muriate of lime | 5 | | |
| Snow | 2 | From + 32° to — 50° | 82 |
| Christ. muriate of lime | 3 | | |
| Snow | 3 | From + 32° to — 51° | 83 |
| Potash | 4 | | |

TABLE III.—This Table consists of FRIGORIFIC MIXTURES selected from the foregoing tables, and *combined*, so as to *increase* or *extend* cold to the extremest degrees.

*Combinations* of FRIGORIFIC MIXTURES.

| MIXTURES. | | Thermometer sinks. | Deg. of cold. |
|---|---|---|---|
| | *parts* | | |
| Phosphate of soda ..... | 5 | | |
| Nitrate of ammonia ... | 3 | From 0° to — 34° | 34 |
| Diluted nitric acid..... | 4 | | |
| Phosphate of soda..... | 3 | | |
| Nitrate of ammonia ... | 2 | From — 34° to — 50° | 16 |
| Diluted nitric acid..... | 4 | | |
| Snow ..... | 3 | | |
| Diluted nitric acid ..... | 2 | From 0° to — 46° | 46 |
| Snow ..... | 8 | | |
| Diluted sulphuric acid | 3 | From — 10° to — 56° | 46 |
| Diluted nitric acid..... | 3 | | |
| Snow ..... | 1 | | |
| Diluted sulphuric acid | 1 | From — 20° to — 60° | 40 |
| Snow ..... | 3 | | |
| Muriate of lime..... | 4 | From + 20° to — 48° | 68 |
| Snow ..... | 3 | | |
| Muriate of lime..... | 4 | From + 10° to — 54° | 64 |
| Snow ..... | 2 | | |
| Muriate of lime..... | 3 | From — 15° to — 68° | 53 |
| Snow ..... | 1 | | |
| Chryst. muriate of lime | 2 | From 0° to — 66° | 66 |
| Snow ..... | 1 | | |
| Chryst. muriate of lime | 3 | From — 40° to — 73° | 33 |
| Snow ..... | 8 | | |
| Diluted sulphuric acid | 10 | From — 68° to — 91° | 23 |

Cold, *effects of.* Different animals will endure different degrees of cold without injury. Some perish suddenly upon the approach of intense cold, such as insects of almost all kinds: others are only thrown into a state of lethargic insensibility, from which they revive again upon the return of warm weather, such are the hybernating animals, as land-tortoises, dor-mice, &c. Man is capable of bearing very wonderful degrees of heat and cold: from 212° of Fahrenheit's thermometer and even upwards, though this is the heat of boiling water; to 30° or 40° or even more below 0 or zero. The cold at Quebec has sunk as low as —42°, and at Tornao M. Maupertius experienced a cold at —51° below the zero, and this is said to be nothing compared with what it has been known in some parts of Siberia; in which cases respiration is accompanied with prodigious pain, and seems to fill the lungs as with boiling liquid, while from the increased elasticity, of the air, the surrounding rocks and trees often split with reports like cannon.

Colebrooke Dale, claims a short notice on account of its various works: it is situated on the banks of the Severn between two vast hills which break into various forms, being all thickly covered and forming beautiful sheets of hanging woods. Here are the most considerable iron works in England: the noise of the forges, mills, &c. with all their vast machinery, the flames bursting from the furnaces, with the burning coal, and the smoke of the lime-kilns are altogether horribly sublime. Two beautiful bridges of cast-iron, give these scenes a still nearer resemblance to the ideas of romance. There is, also, in the dale, a remarkable

spring of fossil bar or petroleum, which has yielded a vast quantity of that substance.

Coleoptera: the first order of insects in Linnæus' zoological system, which includes all those whose wings are guarded by a pair of strong, horny, exterior cases or coverings under which the wings are folded up when at rest. In common language these insects are called beetles. This order contains an immense number of insects.

College, an assemblage or society of persons. In a more limited sense, a college is a public place, endowed with certain revenues, where the several parts of learning are taught, and where the students reside, under a regular discipline. An assemblage of several of these colleges is called a *university*. The erection of colleges is part of the royal prerogative, and not to be done but in the king's name. The establishment of colleges or universities forms a remarkable period in literary history. The schools in cathedrals and monasteries confined themselves chiefly to the teaching of grammar. There were only one or two masters employed in that charge; but in colleges, professors are appointed to teach all the branches of science. The first obscure mention of academical degrees in the university of Paris, from which the other universities of Europe have borrowed most of their customs and institutions, occurs, A. D. 1215.

College *of civilians*, a college founded by Dr. Harvey, dean of the court of arches, for the professors of the civil law residing in London. Here, also, the courts of civil law are held.

College, *Gresham*, founded by sir Thomas Gres-

ham, and endowed for seven lecturers, who now receive £. 100 per annum for reading, during term-time, on divinity, geometry, astronomy, music, law, physic, and rhetoric. The lecture-room is over the Royal Exchange of London, with the revenue of which building the institution is endowed.

College *of heralds*, a corporation founded by Rich. III. subordinate to the earl-marshal of England, and to which, under that officer, belongs whatever relates to armorial bearings and pedigrees. Their house, usually called the *Heralds office*, where the court of the earl-marshal is held, is situate on Benet's-hill, near St. Paul's church, London. Scotland, also, has its *college of heralds*.

College *de propaganda fide*, founded at Rome in 1622, by Gregory XV. consists of thirteen cardinals, two priests, and a secretary, and was designed for the propagation and maintenance of the Romish religion in all parts of the world.

College, *Sion*, a college and hospital. A college for the clergy of London, who were incorporated in 1630, in pursuance of the will of Dr. White, under the name of the *President and fellows of Sion college;* and an hospital for ten poor men, and as many women.

Collegiate *churches*, those that, without a bishop's see, have the ancient retinue of a bishop; such as the church of St. Peter's, Westminster. This was anciently a cathedral; but the revenues of the monastery being vested in the dean and chapter by act of parliament (1 Elizabeth), it became a collegiate church. In several causes, the styling this church *cathedral* instead of *collegiate*, has occasioned errors in the pleadings.

Collimation, line of, in a telescope, is that which passes through the tube, and cuts both the focus of the eye-glass and the centre of the object-glass.

Collision, in mechanics, is the meeting or mutual striking of two or more bodies, one of which, at least, is in motion. See Percussion.

Colon, in grammar, a point or stop, marking the sense of the passage; but concerning the precise manner of using which, writers are by no means agreed. In some respects, too, it may be added, no precise rule can ever be laid down, much depending upon the peculiar construction of the sentence; the particular meaning that the writer would convey; and the degree of emphasis that he is desirous to impress. As far, however, as the positive use of stops can be prescribed, some observations will be found on this subject, under the article *Punctuation*.

Colonel, the commander in chief of a regiment, whether horse, foot, or dragoons. A colonel may lay any officer under arrest, but must acquaint the general therewith. He is not allowed a guard; but has a centry from the quarter-guard.

*Lieutenant* Colonel, one who commands a regiment of guards whereof the king, prince, or other person of the first eminence, is colonel. He has a colonel's commission, and is usually a general-officer.

Colonel *lieutenant*, the second officer in a regiment, at the head of the captains, and commander in the absence of the colonel.

Colony, a company of people transplanted into a remote province in order to cultivate it. There are three kinds of colonies, 1. Those serving to

ease a country, where the people are become too numerous. 2. Those established by conquerors in the midst of vanquished nations to keep them in awe and obedience. 3. Colonies of Commerce, in which trade is the sole object of their establishment.

Colossians, Epistle to the, a canonical epistle of the New Testament, written at the time of that to the Ephesians towards the close of Paul's imprisonment at Rome, about the 63d year of the Christian æra, and the ninth of the emperor Nero.

Colossus, a statue of enormous or gigantic proportions. That particularly spoken of under this name, was an Apollo, of the height of 126 feet, erected at Rhodes; the workmanship of Chares, who devoted himself to this object during twelve years. It was of brass, and is said to have existed nearly fourteen centuries, before the period in which it fell by the shock of an earthquake. When the Saracens became possessed of Rhodes, they found the statue in a prostrate state, and sold it to a Jew, by whom 900 camels were laden with the materials. The base on which it stood was of a triangular figure; and its extremities were sustained by 60 pillars of marble. There was a winding staircase, by which persons ascended to its summit; and, in a looking-glass hung from its neck, Syria and the ships that went to Egypt were seen. This stupendous image is justly reckoned one of the *seven wonders* of human art. Among the antiquities of Rome, are seven famous Colossuses; of which two are statutes of Jupiter, two of Apollo, one of Nero, one of Domitian, and one of the Sun.

Colour, in physics, is stated to be "a property

inherent in light, by which, according to the various sizes of its parts, or from some other cause, it excites different vibrations on the optic nerve; which, propagated to the sensorium, affect the mind with different sensations." Every ray of light is supposed, by sir I. Newton, to be divided into seven colours, viz. *Red*, *orange*, *yellow*, *green*, *blue*, *indigo*, *violet*. Others contend that there are but three primary colours, viz. the *red*, the *green*, and the *violet*. See Optics.

Colour, musical scale of. It is found that if the spectrum of the sun's image formed by refracted light, let into a darkened room, be longitudinal divided by the points separating the different colours, into 360 parts, the

| | |
|---|---|
| Red will occupy | 45. |
| Orange | 27. |
| Yellow | 48. |
| Green | 60. |
| Blue | 60. |
| Indigo | 40. |
| Violet | 80. |

Colour, in painting, is a word used both for the drugs or pigments, and for the tints they produce.

Colours, *oil*, those pigments that may be used in painting in oil. I. The principal *colours* used in painting flesh, and from which all the tints are made, are these: 1. Flake-white, or fine white, which should be ground with the finest poppy-oil. White is a friendly-working colour, and comes forward with yellows and reds, but retires with blues and greens. As it is the nature of all whites to sink into whatever ground they cover, they should always be laid on white. 2. Ivory-black,

the best black, and a colour that sympathizes and mixes kindly with every other. It is a true shade for blue; and, with a little Indian-red, makes the best general shadow-colour. It is ground with linseed-oil, and used with drying-oil. Black is a cold, retiring colour. 3. Ultramarine, the finest blue in the world; but costly, and seldom used. It is a tender retiring colour, never glaring, beautiful for glazing, and used with poppy-oil. 4. Prussian, a very fine blue, and a good working-colour. It is ground with linseed-oil, though nut-oil is more proper. It should never be used in the flesh; but always in the green-tint, and the eyes. 5. Light-oker, a friendly-mixing colour, and of great use in the flesh: it is usually ground with linseed-oil, but nut-oil is better. All yellows are strengthened with reds, and weakened with blues and greens. 6. Light-red or light burnt-oker: this, with white, produces the most perfect flesh-colour that can be made. It is a beautiful, clean, kind-working colour; but too strong for the white, and therefore will grow darker. It should be ground and used with nut-oil. 7. No vermilion, but what is made of the true native cinnabar, should ever be used. It will not glaze; but is a fine colour when glazed itself. It is ground with linseed-oil, and should be used with drying oil. 8. Carmine, the most beautiful crimson, a middle colour between lake and vermilion, is a fine working colour, glazing delightfully. It should be ground with nut-oil, and used with drying-oil. 9. Lake, a tender, sympathizing, deep red; but of no strong body, and therefore to be strengthened with Indian-red. It is the best glazing-colour that can be used. It is

ground with linseed-oil, and used with drying-oil. 10. Indian-red, a strong, pleasant working-colour: but it will not glaze well; and, when mixed with white, it falls a little into the lead. It is ground and used as lake. 11. Brown-pink, a fine glazing-colour; but of no strong body: in the flesh it should never join, or mix with, the lights; because this colour and white antipathize, and mix of a warm, dirty hue: for which reason, also, their joinings should be blended with a cold middle-tint. In glazing of shadows, it should be laid before the colours that are to enrich it: it is one of the finishing colours, and therefore should never be used alone in the first painting. It is strengthened with burnt-umber, and weakened with terra-vert': ground with linseed-oil, and used with drying-oil. 12. Burnt-umber is a fine, warm brown, and an easy-working, strong colour, it is of great use in the hair, and mixes charmingly with the warm shade.

II. The principal *tints* that are absolutely necessary for painting flesh, all of which are made from the principal colours, are these: 1. Light-red tint is made of light-red and white: it is the most kind and best-conditioned of all colours for the general ground of the flesh. With this, and the shade-tint, all the flesh should be made out, like claro-obscuro, or mezzotinto. It should also be remembered, that this colour will grow darker, because it is in its nature too strong for the white: wherefore it should be improved; that is, some vermilion and white mixed with it, in proportion to the fairness of the complexion. 2. Vermilion-tint is vermillion and white, mixed to the middle-tint: it is the most bril-

liant pale-red, and agrees particularly well with the white, light, and yellow tints. 3. Carmine-tint, is carmine and white, mixed to a middle-tint, and the most beautiful red that can be used for the cheeks and lips: it is one of the finishing colours, and should never be used in the first painting, but laid upon the finishing colours, without mixing. 4. Rose-tint is made of the red-shade, and white, mixed to a middle degree, or lighter. It is one of the cleanest and most delicate tints that can be used in the flesh, for clearing up the heavy, dirty colours; and, in changing, it sympathizes and mixes kindly. 5. Yellow-tint is often made of Naples-yellow and white: but others use light-oker, which is a good working colour. It is to be remembered, that oker is too strong for the white, and, therefore, a little allowance should be made in using it. It follows the light-red tints, and should always be laid before the blues. If too much of it is laid, the ground it has been laid on may be recovered with the light-red tints. 6. Blue tint is made of ultramarine, or prussian, and white, mixed to a lightish azure: it is a pleasant working colour: and with it should be blended the gradations. It follows the yellows, and with them makes the greens; and with red, produces the purples. No colour is so proper for blending down, or softening the lights into keeping. 7. Lead-tint is made of ivory-black and fine white, mixed to a middle degree: it is a fine retiring colour, and therefore is of great use in the gradations, and in the eyes. 8. Green-tint is made of prussian, light oker, and white. This colour will dirt the lights, and should be laid sparingly in the middle-tints: it is most used in the red shadows,

where they are too strong. It is of a dirty, antipathizing nature. 9. Shade-tint, is made of lake, Indian-red, black, and white, mixed to a beautiful murrey-colour, of a middle tint. This is the best colour for the general ground of shadows; for which reason it is here called the shade-tint: it mixes with the lights delightfully, and produces a pleasant, clean colour, a little inclined to the reddish pearl. As all the four colours of its composition are of a friendly, sympathizing nature, so, consequently, this will be the same; and may, therefore, be easily changed, by the addition of any other colours. 10. Red-shade, is composed of lake and a very little Indian-red. It is a charming working-colour, and a good glazer; it strengthens the shadows on the shade-tint, receives, when it is wet, the green and blue tints agreeably, and is a good ground for all dark shadows. 11. Warm-shade is made of lake and brown-pink, mixed to a middle degree. It is a fine colour for strengthening the shadows on the shade-tint, whether they are wet or dry. Care must be taken that it does not touch the lights, because they will mix of a dirty snuff-colour; and it should therefore be softened with a tender, cold tint. 12. Dark-shade, is made of ivory-black and a little Indian-red only. This colour mixes very kindly with the red-shade, and sympathizes agreeably with the middle tints in the dead-colouring. It is a charming glazing-colour for the eyebrows and darkest shadows; of all others, the most excellent shadow-colour; and one of the finest working-colours we possess.

III. The colours and tints that are necessary for the *first painting* of the flesh, are those:—1. Fine-

white; 2. light oker, and its two tints; 3. light red, and its two tints; 4. vermilion, and its tint; 5. a tint, made of lake, vermilion, and white; 6. rose-tint; 7. blue-tint; 8. lead-tint; 9. green-tint; 10. half-shade tint, made of indian-red, and white; 11. shade-tint; 12. red-shade; 13. warm-shade. The finishing pallet for a fine complexion requires six more, *viz.* carmine and its tint, lake, brown-pink, ivory-black, and prussian-blue.

IV. The principal *colours* used in *landscapes*, are, 1. Fine-white; 2. common-white; 3. fine light-oker; 4. brown-oker; 5. brown pink; 6. burnt-umber; 7. ivory-black: 8. prussian blue; 9. ultra-marine; 10. terra-vert; 11. lake; 12. indian-red; 13. vermillion; 14. king's-yellow.

V. The principal *tints* used in landscapes, are, 1. light-oker and white; 2. light-oker, prussian, and white; 3. light-oker and prussian; 4. the same, darker; 5. terra-vert and prussian; 6. brown-pink and prussian; 7. brown-pink and brown oker; 8. brown-oker, and prussian; 9. indian red and white; 10. ivory-black, indian-red, and lake. The *colours* necessary for *dead-colouring*, are, common-white, light-oker, brown-oker, burnt-umber, indian-red, ivory-black and prussian. The principal *colours* for painting the sky, are fine white, ultramarine, prussian, light oker, vermillion, lake, and indian-red. The *tints* are a fine azure, like oker and white, vermilion and white; and a tint, made of white, a little vermilion, and some of the light azure.

VI. The principal *colours* that are necessary for painting *back-grounds in portraiture*, as walls, or buildings, are white, black, indian-red, light and brown oker, prussian, and burnt-umber, from which

the eight principal *tints* are made, as follows: 1. pearl, of black, white, and a little indian-red; 2. lead, of black and white, mixed to a dark lead colour; 3. yellow, of brown-oker and white; 4. olive, of light oker, prussian, and white; 5. flesh, of indian-red and white, mixed to a middle tint; 6. murrey, of indian-red, white, and a little black, mixed to a kind of purple, of a middle tint; 7. stone, of white, umber, black, and indian-red; 8. dark-shade, of black and indian-red, only. Here, the lead-tint serves for the blues; the flesh-tint mixes agreeably with the lead; and the murrey is a very good blending colour, and of great use where the olive is too strong. The umber, white, and dark-shade, will produce a fine variety of stone-colours: the dark-shade and umber, used plentifully with drying oil, make a charming warm shadow-colour. All the colours should be laid with drying oil only, because they mix and set the better with the softener.

COLOURS, *Water*, those that are used in painting with gum-water, or size, of which such as are resinous, or gummy, are not miscible with oil.

COLOURS *of plants.* The primitive colours, and their intermediate shades and gradations, are enumerated by botanists, as follows:

| *English.* | *Latin.* |
|---|---|
| Water-colour. | *Hyalinus.* |
| WHITE. | |
| Lead-colour. | *Cinereus.* |
| BLACK. | NIGER. |
| Brown. | *Fuscus* |
| Pitch-black. | *Ater.* |

| *English.* | *Latin.* |
|---|---|
| YELLOW | LUTEUS. |
| Straw-colour. | *Flavus.* |
| Flame-colour. | *Fulvus.* |
| Iron, or rust-colour. | *Gilvus.* |
| RED. | |
| Flesh-colour. | *Incarnatus.* |
| Scarlet. | *Coccineus.* |
| PURPLE. | |
| Violet-colour. | *Cæruleo-purpureus.* |
| BLUE. | CŒRULEUS. |
| GREEN. | |

Linnæus has laid down the following general positions on the indications of colour with respect to the virtues of vegetables. A yellow-colour commonly indicates a bitter taste; as in gentian, aloe, celandine, and turmeric. Red, an acid or sour taste; as in cranberries, barberries, currants, raspberries, mulberries, cherries, the fruit of the rose, sea-buckthorn, and service-tree. Herbs that turn red toward autumn, have likewise a sour taste; as sorrel, wood-sorrel, and bloody-dock. Green indicates a crude alkaline taste, as in leaves and unripe fruits. A pale colour denotes an insipid taste, as in endive, asparagus, and lettuce. White promises a sweet and luscious taste; as in white currants and plums, sweet apples, &c. Lastly, black indicates a harsh, nauseous, disagreeable taste; as in the berries of deadly-night-shade, myrtle-leaved sumach, herb-christopher, and others; many of which are not only unpleasant to the taste, but pernicious and deadly in their effects.

COLOURS, in heraldry, are red, blue, black, green, and purple; which the heralds call GULES, AZURE,

SABLE, VERT, and PURPURE. Tenue or tawny, and sanguine, are not so common. The yellow and white, called *or* and *argent*, are metals, not colours. The metals and colours are sometimes expressed in blazon by the names of precious stones, and sometimes by those of planets or stars.

COLOURS, in military affairs, include the banners, flags, ensigns, &c. of all kinds, borne in the army or fleet.

COLOURS in the Latin and Greek churches. There are five admitted into the Latin church, viz. the *white* for the mysteries of Christ, the feasts of the virgin, angels, saints, and confessors: the *red* for the solemnity of the holy sacraments, the feasts of the apostles, &c.; the *green* for the time between Pentecost and Advent; the *violet* in Advent and Christmas, and in votive masses in time of war, and the *black* for the dead and the ceremonies belonging thereto. In the Greek church, the use of colours is nearly abolished; the red was the colour for Christmas and the dead, as black is among us.

COLUBER, the viper, in natural history. Of this genus, there are 175 species. The coluber *ferus* is found in most parts of Europe; it lives in woods and thickets, and, in breeding time, in the open fields: it is poisonous, but not deadly; it grows to a foot and an half long. The flesh was formerly used in medicine as a restorative. The poisonous matter discharged is a real gum, and perhaps the only gum actually produced and secreted by animals of any kind. Olive oil is the most successful application to the bite of a viper. Sucking the wound and throwing out the saliva, is said to be a means of withdrawing part of the venom, and it is

doubtful whether the poison be capable of producing any injury to the system when received into the mouth and stomach, unless the mouth, &c. be sore or ulcerated at the time. The viper is vivaparous, that is, produces her young alive; and, it is asserted, that the female in case of sudden surprize or danger, opens her mouth and admits her young down her throat, till the danger is passed by. The coluber *cerastes* is found in Arabia and Africa, and is probably the asp employed by Cleopatra. This animal springs suddenly to a considerable distance, and bites, without the least provocation, those who approach it. The inhabitants are said to have a preparation of herbs with which they arm themselves against the bite. The coluber *naja*, or hooded snake, is every where exhibited publicly as a show; it is taught to dance to the sound of musical instruments. The Indian jugglers, who thus exhibit the animal, first deprive it of its fangs, to secure themselves and the spectators from injury. See Plate Nat. Hist. Figs. 7 and 8.

Column. See Architecture.

Colures, in astronomy, two great circles supposed to intersect each other at right angles in the poles of the world, and to pass through the solstitial and equinoctial points of the ecliptic. They are hence called the solstitial and equinoctial colures.

Combination, in chemistry, denotes the intimate union of two or more bodies of different natures, from which a new compound results, differing in its nature from either of the constituents. Thus, an acid united with an alkali, gives a neutral salt, and furnishes a good instance of combination. Sulphur

and lime may, by heat, be made to combine and form a sulphuret of lime, which compound is very different from its constituents.

COMBINATIONS, denotes the alternations or variations of any number of quantities, letters, &c. in all possible ways.

COMBUSTIBLES. See the next article.

COMBUSTION, in chemistry, a term which denotes the decomposition of certain substances, accompanied by light and heat. It is an important effect of CALORIC (which see), but only particular bodies are subject to combustion. These are called combustible bodies. Combustible bodies, when inflamed, are sources of light and heat: thus sulphur, coal, &c. are combustible bodies, and being raised to a certain degree of temperature, they give out light and heat. The capacity of producing light and heat gradually diminishes, and what remains after combustion appears to be a different substance, no longer combustible. All bodies that are not combustible are ready to receive caloric, and part with it again, giving out precisely the same quantity, neither more nor less. A stone or brick is incombustible; it will receive heat, but, left to itself, it soon cools again, that is, it gives out the heat which it received, and which is not lost but imparted to surrounding bodies; thus the heat passing from it combines with the atmosphere. Some chemists arrange all bodies under three classes, viz. *combustibles*, *supporters*, and *incombustibles*. In this theory, the *light* is furnished by the *combustible*, and the *heat* by the *oxygen* of the *supporters*. Thus, in the combustion of sulphur, the sulphur affords the light, the oxygen of the air (the air being a sup-

porter) gives out the heat, and the sulphuric acid which is the produce of the combustion, is incombustible. In the combustion of wood or coal; the wood and coal give the light, the oxygen of the air affords the heat, and the pure ashes, which are the result of combustion, are incombustible. These may still be heated to any temperature; but, like the brick or stone, just referred to, they undergo no more change.

Comet, an opaque, spherical, and solid body, like a planet, which appears and disappears abruptly. Comets describe elongated circles, called ellipses, and are visible to us only when they reach those extremities of their orbits that are nearest to us and to the sun. When they pass through the long lines that run from one centre of their ellipsis to another, they appear to describe circles of prodigious magnitude; and very small ones when they arrive at that part of their ellipsis of which the sun is the centre: hence the irregularity attributed to their course. When near the sun, they exhale a mass of vapours, called their *beard*, *tail*, or *hair*. These exhalations, which are not very dense, since the fixed stars may be seen through them, assume the different appearances that are distinguished as already related, according to the circumstances under which they are seen. Thus, when a comet is westward of the sun, and sets after it, it is said to be tailed, because the vapour seen is that which follows it; when the comet is eastward of the sun, and moves before it, it is said to be *bearded*, because the vapour is seen in its van, in the manner of a beard; and when the sun and the comet are exactly opposite each other, the earth between them, the

vapour appears to surround it, in the form of a border of hair. From this last phenomenon the word *comet* is derived: κομη, *coma* "hair." Comets, notwithstanding, have been seen without either tail, beard, or coma, and whose discs were as clear, round, and well defined, as that of Jupiter. See SOLAR SYSTEM.

COMMA, a point or character marked thus (,) serving to denote a short stop in a sentence, and to divide the members of a period.

COMEDY, has been divided into three kinds, according to the ends which it proposes. By pourtraying vice, it renders it contemptible, as tragedy renders it odious: this is *characteristic* comedy. When men are represented as the sport of fortune, it is called *incidental* comedy. When the domestic virtues are drawn in amiable colours, and in situations where misfortune renders them interesting, it may be termed *sentimental* comedy. The *first* kind is the most useful to manners; the strongest, the most difficult, and the most rare: the *second* is the most successful and popular: the *third* excites a deeper interest, because the examples it holds forth affect us more nearly. There is also a style of comedy superior to these which unites the characteristic with the sentimental: such is the "School for Scandal."

COMMENDAM. See *Benefice in Commendam.*

COMMERCE, the exchange of one thing for another, is usually understood to mean that trade which takes place between separate nations, and is conducted by a superior class of traders, styled merchants. In a philosophical point of view, much

has been said for and against this great business of civilized countries. Narrow-minded moralists expatiate largely upon the evils with which it fills society. They dwell with a pleasure that shall not hastily be called malicious, upon the thought that, at some former period, "Tea, coffee, and chocolate, were never tasted, *except in great or rich families*: but, now, the articles of tea and sugar are in common use; we send to the East and West Indies to furnish our poor with breakfasts! The wives of day-labourers, and the very alms-house-women, drink tea twice a day!"—and a more rational complaint was made by an Indian of Louisiana, when he said that, in his country, the young men overworked themselves to procure baubles for their wives, which Europeans had introduced. That luxury, the offspring of commerce, is a colossal monster, who, from his cradle upward, spreads social disorder and individual wretchedness, is a fact not less true than serious; and, did any thing the world exhibits, authorize us to believe that human life was intended to keep that unagitated course, which it is one disposition of the mind to desire, we might load it with unqualified execration: but, since man appears to be innately active, and in all situations exposed to evil, we may survey, with a less heated imagination, activity of this particular kind, and evil of this particular form. To commerce, with all its mischiefs, with all its crimes, committed upon every shore, its depopulation of fields, and corruption of cities, to commerce we must attribute that growing intimacy between the members of the human race from which great benefits have redounded, and greater still may spring.

Commerce, on the whole, is highly favourable to the intellectual part of man, and, perhaps, as injurious to the animal: it multiplies his ideas, and his wants; brings riches to nations, and poverty to individuals, making the rich poor, and the poor, "poor indeed." In nations under these circumstances, it has been justly observed, every man that does not turn his talents to account, will find himself left behind in the universal emulation. Commerce is divided into commerce by land, and that by sea: inland or domestic, and foreign; and by wholesale and retail. The king is arbiter of domestic commerce, since it pertains to his prerogative to establish public marts, as markets and fairs, to regulate weights and measures, and to give money, which is the universal medium of commerce, authority and currency. A great part of the foreign commerce of England is now carried on by collective companies, some incorporated by the King's Charter with an exclusive privilege, as the East India company; others only private associations, as the Turkey and Hamburg companies.

The total official value of all the imports and exports of Great Britain for three years ending on the fifth of January 1808 is as follows:

| Year ending | *Imports.* | *Exports.* |
|---|---|---|
| 5th. Jan. 1806 | £. 30,344,628 | £: 34,954,845 |
| 1807 | 28,835,907 | 36,527,187 |
| 1808 | 29,153,101 | 34,586,045 |

Commission of Bankruptcy, is that issued by the Lord Chancellor, on persons becoming bankrupts within any of the statutes, and directed to any of the commissioners, who are appointed to examine into it,

and to secure the bankrupts' lands and effects, for the satisfaction of the creditors. The proceedings relate either to the bankrupt himself;—or his property. In the former case a petition is presented to the lord chancellor by one creditor to the amount of 100*l.* or by two to the amount of 150*l.* or by three or more to the amount of 200*l.* in consequence of which, he grants a commission to certain persons denominated commissioners of bankrupts. The petitioners are bound in a security of 200*l.* to make the party amends, in case they do not prove him a bankrupt: and if they receive any of the bankrupt's money or effects, as a recompense for suing out the commission, so as to obtain more than their due proportion of his estate, they forfeit the same, together with the whole debt.

Assignees are chosen, and creditors called upon to prove their debts, and the bankrupt, at the third meeting of the creditors, is obliged to surrender all his property into the hands of the assignees, and if he conceal any to the amount of 20*l.* or upwards, he is liable to the punishment of death, and his effects are then to be divided among his creditors. But if he make a true discovery of all his effects, and has acted to the satisfaction of his creditors, and they, or four fifths of them, in number and value, will sign a certificate to that purport, the commissioners are to authenticate the same, and transmit it to the chancellor, who grants his certificate to the bankrupt, and he is then entitled to a certain allowance out of his effects, in proportion to the dividend paid. In consequence of such certificate, he is discharged from every debt owing by him at the time of his bankruptcy. The assignees are

bound to make a dividend within 12 months, and a second or final one within 18 months after the commission issued.

COMMITMENT, is the sending a person to prison by warrant or order, either for a crime or contumacy. If for a crime, the warrant must be discharged according to law; but for contumacy, it remains in force until he comply and perform the thing required. The commitment should be in writing, otherwise by the "Habeas Corpus" act, the prisoner may be admitted to bail whatever his offence may have been.

COMMITTEE *of parliament*, a certain number of members appointed by the house to proceed on some specific business. The whole house frequently resolves itself into a committee, in which case, each member has a right to speak as often as he pleases. When the house is not in committee, each gives his opinion regularly, and is only allowed to speak once, unless to explain himself.

COMMODORE, corrupted from the Spanish word *commendador*, a general officer in the British marine, invested with the command of a detachment of ships of war, during the period of which he bears the rank of brigadier-general in the army, and is distinguished from the other ships of his squadron by a broad pennant at his foretop. The name is also given to the oldest captain in a fleet of merchantmen, who leads the van in time of war, and carries a light in his top, to keep the fleet together.

COMMON-LAW, or the *unwritten law*, thus called, says M. De Lolme, because not founded on any known act of the legislature. It receives its force

from immemorial custom; and, for the most part, derives its origin from acts of parliament made in the times that immediately followed the conquest, particularly those anterior to the time of Richard the First, the originals of which are lost. The principal objects settled by the common-law, are the rules of descent, the different methods of acquiring property, and the various forms required for rendering contracts valid; in all which points it differs, more or less, from the civil-law. Thus, by the common-law, lands descend to the eldest son, to the exclusion of all his brothers and sisters; whereas, by the civil-law, they are equally divided between all the children: by the common-law, property is transferred by *writing;* but, by the civil-law, *tradition*, or actual delivery, is moreover requisite, &c. The source from which the decisions of the common-law are drawn, is what is called *præteritorum memoria eventorum*, and is found in the collection of judgments that have been passed from time immemorial, and which, as well as the proceedings relative to them, are carefully preserved under the title of *records*. In order that the principles established by such a series of judgments may be known, extracts from them are, from time to time, published under the name of *reports;* and these reports reach, by a regular series, so far back as the reign of Edward II. inclusively. Besides this collection, which is pretty voluminous, there are also some ancient authors of great authority among lawyers; such as Glanvil, who wrote under Henry II.—Bracton, who wrote under Henry III.—Fleta and Lyttleton. Among more modern authors, is sir Edward Coke, lord

chief-justice of the king's-bench, under James I. who has written four books of Institutes, and is at present the oracle of the common law. This law, moreover, comprehends some particular customs, which are fragments of the ancient Saxon laws, escaped from the disaster of the conquest; such as that called *gavel-kind*, in the county of Kent, by which lands are equally divided between the sons; and that called *borough-English*, by which in some particular districts, lands descend to the youngest son.

Common *Measure*, is that which measures two or more things without a remainder. Thus of 8 and 12, a common measure is 2 and 4. The *greatest* common measure is the greatest number that can measure two other numbers; thus of 8 and 12 the greatest common measure is 4. To find the greatest common measure: "Divide the greater term by the less, then divide the divisor by the remainder if there be any, and so on continually till nothing remains, then is the last divisor the greatest measure sought."

Common-place book, a register of such thoughts and observations as occur to a person of reading or reflection. Mr. Locke's celebrated method of arranging a common-place book is explained as follows:

The first page is to serve as a kind of index to the whole, containing references to every place or matter therein; and in the commodious contrivance of this index, so as that it may admit of a sufficient copiousness without any confusion, all the secret of the scheme consists. To this end, the first page, as already mentioned, or for more room, the num-

ber of pages necessary, are to be divided by parallel lines into 25 equal parts; whereof every fifth line is to be distinguished by its colour, or other circumstance. These lines are to be cut perpendicularly by others, drawn from top to bottom, and in the several spaces thereof the letters of the alphabet, capital and minuscle, duly written. The form of the lines and divisions, both horizontal and perpendicular, will be conceived from the following specimen; wherein what is to be done for every letter of the Alphabet, is shewn in the two first: A, B.

| | |
|---|---|
| A. | *a*<br>*e*<br>*i*<br>*o*<br>*u* |
| B. | *a*<br>*e* 1, 2.<br>*i*<br>*o*<br>*u* |

The index being thus formed, the book is ready for receiving insertions. In carrying them to the index, it is to be considered to what head the matter to be entered is most naturally referred, and

under which it would most commonly be sought. In this head, or word, regard is to be had to the initial letter, and the first vowel, which are the characteristic letters upon which all the use of the index depends. "Suppose, for instance, I would enter down a passage that refers to the word *beauty*. *B*, I consider, is the initial letter, and *e* the first vowel: then, looking upon the index for the partition *B*, and therein, for the line *e* (which is the place for all words whose first letter is *b*, and first vowel *e*; as *beauty*, *beneficence*, *bread*, *breeding*, *blemishes*,) and, finding no numbers already down to direct me to any page of the book where words of this characteristic have been entered, I turn forward to the first blank page I find (which, in a fresh book, may be the second), and here write what I have occasion for on the head of *beauty*; beginning the head in the margin, and indenting all the other subservient lines that the head may stand out and show itself: this done, I enter the page, where it is wrote, (viz. 2.) in the index, in the space *B-e*; from which time the class *B-e* becomes wholly in possession of the 2d and 3d pages, which are consigned to words of this characteristic. —Had I found any page or number already entered in the space *B-e*, I must have turned to the page, and wrote my matter in what room was left therein: so, if after entering the passage on beauty, I should have occasion for *benevolence*, or the like, finding the number 2 already possessed of the space of this characteristic, I begin the passage on benevolence in the remainder of the page; which not containing the whole, I carry

it on to page 3, which is also for *B-e;* and add the number 3 in the index.

Common-pleas, one of the king's courts, formerly part of the *aula regis;* but as this latter court was bound by its institution to follow the person of the king, and private persons experienced great difficulties in obtaining relief from a court that was ambulatory, and always in motion, it was made one of the articles of the great charter that the court of common-pleas should thence forward be held in a fixed place; and since that time it has been seated at Westminster. It is composed of a lord chief-justice, with three other judges; and appeals from its judgments, usually called *writs of error*, are carried before the court of King's bench. All civil causes, as well real as personal, are triable in this court, according to the law of the land. In personal and mixed actions it has an equal jurisdiction with the king's bench; but can take no cognizance of pleas of the crown. Thus informations, in which the king is plaintiff, and the suit criminal, can only be allowed or *granted*, in the king's bench.

Commons, *House of*, the popular branch of the legislature and government of Great Britain, and the basis of the British constitution. The origin of this assembly ought, perhaps, to be attributed to the necessity under which the first Edward perceived himself of counteracting a powerful aristocracy. The feudal system had erected a band of petty monarchs from whom the crown was in perpetual danger. It is to the struggles of these men with regal authority, in the course of which, in order to strengthen their opposition, they were obliged to make a common cause with the people,

that M. De Lolme attributes the existence of English liberty. The same motive would equally induce the sovereign to pursue the same measures, and seek security against the nobles in the popular affection. It was natural, too, that he should endeavour, by every means within his reach, to give power to those whom he had thus disposed to be his friends. Accordingly, the illustrious Henry II. had commenced the gradual, but certain destruction of the Norman monster, in the vitals, by giving charters to several towns, from which the citizens claimed freedom and privileges, independent of any superior but himself; and in the distracted reign of Henry III. the earl of Leicester first introduced the Commons into the government, when, in order to strengthen himself with the power of the people against foreign combinations, he called a parliament; and, beside the usual members, ordered returns to be made of two knights from every shire, and deputies from the boroughs. This, however, was the act of a rebel: the first assemblage of the Commons, by the crown, took place in 1295. M. de Lolme, who seems inclined to show more grace to aristocracy than to monarchy, describes the event and its motives in the following words:

"Edward, continually engaged in wars, either against Scotland, or on the Continent, seeing moreover his demesnes considerably diminished, was frequently reduced to the most pressing necessities: but though, in consequence of the spirit of the times he frequently indulged himself in particular acts of injustice, yet he perceived that it was impossible to extend a general oppression over a body of nobles and a people, who knew so well how to unite in a

common cause. In order to raise subsidies, therefore, he was obliged to employ a new method, and to endeavour to obtain, through the consent of the people, what his predecessors had hitherto expected from their own power. The sheriffs were ordered to invite the towns and boroughs of different counties to send deputies to parliament; and it is from this era that we are to date the legal origin of the house of commons."

This writer, who has always in view the establishment of a favourite and apparently well-founded position, that the *great power* of the English crown produced the union and consequent liberty of all orders of subjects, has taken care to leave his narrative unincumbered with collateral circumstances, unnecessary to that argument, but of much historical importance. Not only to the disturbances of the state, but to the new condition of the commonalty also, must be attributed the ascendency they gained. It was agriculture and trade, the infant efforts of which the charters of the boroughs had fostered, that broke the hereditary league, that first made freemen of slaves, and then made freemen the rivals of princes. Property, at the period of which we speak, had changed its owners. The croisades had stripped the gentry, and filled the coffers of artisans. In Italy, this property actually purchased charters; in England, it is possible, it sometimes did the same: at any rate, it gave consideration, and rendered even unennobled blood respected and courted. In a word, the house of commons arose on the ruins of the feudal fabric, gained ground as that decayed, pressed on its weaker parts, and, finally, levelled it with the dust

M. de Lolme very justly represents the right of granting money to the crown as the point upon which the very existence of the commons depends; and their total exclusion from all share in the executive power, as the security of the people that, in electing representatives, they do not create tyrants. The faithfulness with which, in consequence of that restraint, they have served their constituents, is evinced, he remarks, in the uniformity with which every public struggle in England has ended in the obtention of, not their personal aggrandisement, but popular advantage. It was thus during, and at the conclusion of, the wars of York and Lancaster, and at the accession of James I. when the reception of a new family was in some sort a revolution, and certain demands were insisted on. After the accession of Charles I. the first serious discontents terminated in the act called the *Petition of Right*, a paper that is still regarded as an accurate delineation of the rights of the people. Their subsequent assumptions he attributes to the loss of that balance which the crown should maintain, on the day in which the king gave up his power of dissolving his parliament; that is, from the day in which the members of that assembly acquired an independent, personal, permanent authority: an authority which they soon began to turn against the people who had raised them to it. In support of the honourable character of this house, when acting under its proper constitution, he farther adduces the instance of the revolution of 1688, at which era, he observes, the political wonder again appeared—of a revolution terminated by a series of acts in which no interests but those of

the people were considered and provided for; no clause, the most indirect, inserted, either to gratify the present ambition, or favour the future views, of those who were personally concerned in bringing those acts to a conclusion;—the disinterested laws it has framed, among which he instances the famous (and most justly famous) *Habeas-corpus* act, to which, says judge Blackstone, "the oppression of an obscure individual gave rise;" the jealousy and zeal with which it has watched the execution of the laws; its resentment of the attack made on sir John Coventry; the abridgement of its personal privileges; and the infliction of justice on its own members.

In all cases of public offence, down to a simple breach of the peace, the members of the house of commons have no privilege whatever above the rest of the people: they may be committed to prison by any justice of the peace; and are afterward dealt with in the same manner as any other subjects. With regard to civil matters, their only privilege is to be free from arrests during the session, and forty days before, and forty days after; but they may always be sued, by process against their goods, for any just debt. They have also the small, and, as public men, very appropriate privilege of receiving all letters by the general-post free of expense, and franking their own to others, to the number of ten a day.

Though each member is elected by a distinct body of people, he is, from the moment of his election, the representative not of those particular persons only, like the States-General of the United Provinces, and the deputies of the Swiss Cantons,

but of the kingdom at large; and is to consider himself not merely as the organ through which his constituents may speak, but as one who having been intrusted with a general charge, is to perform it to the best of his judgment. In performance of this great function, his liberty of speech is bounded only by those rules of decency of which the house itself is the judge; and while, on the one hand, he is free to propose what laws he pleases, on the other, he is exposed, as a private man, to the operation of the laws he makes.

This assembly is composed of six hundred and fifty-eight members, returned for the several parts of the empire in the following proportion:

| | *Memb.* | *Total.* |
|---|---|---|
| *England,* | | |
| 40 counties, 2 each | 80 | |
| 25 cities (Ely none, London 4) | 50 | |
| 167 boroughs, 2 each | 334 | |
| 5 boroughs, 1 each | 5 | |
| 2 universities, 1 each | 4 | |
| 8 cinqueports, 2 each | 16 | —489 |
| *Wales,* | | |
| 12 counties, 1 each | 12 | |
| 12 boroughs (Pembroke 2, Merioneth none) | 12 | — 24 |
| *Scotland,* | | |
| Counties | 30 | |
| Cities and boroughs | 15 | — 45 |
| *Ireland* | 100 | —100 |
| Total number of representatives of the united kingdom | | 658 |

COMMONWEALTH, in a general sense, any form of government; in an absolute one, a republic. See REPUBLIC.

COMPANY, in a commercial sense, a society of merchants, mechanics, or other traders, joined together in a common interest. The mechanics of incorporated towns are thus erected into companies [See *Livery Companies.*] The term is also applied to large associations set on foot for purposes of commerce. When companies do not trade upon a joint stock, but are obliged to admit any person properly qualified, upon paying a certain fine, and agreeing to submit to the regulations of the company, each member trading upon his own stock, and at his own risk, they are called *regulated companies;* when they trade upon a joint stock, each member sharing in the common profit or loss, in proportion to his share in the stock, they are called *joint-stock companies. Regulated companies* are intirely similar to the corporations of trades, and are a sort of enlarged monopolies of the same kind. As no inhabitant of a town can exercise an incorporated trade without first obtaining his freedom in the corporation; so in most cases no subject of the state can lawfully carry on any branch of foreign trade for which a regulated company is established, without first becoming a member of that company. The regulated companies for foreign commerce, at present subsisting in the united kingdom, are the *Hamburg-company*, the *Russia-company*, the *Eastland-company*, the *Turkey-company*, and the *African-company.*

COMPANY, *joint-stock*, differs essentially, not only from regulated companies, but also from private

copartneries. 1. In a private copartnery, each member may, upon proper warning, withdraw, and demand his share of the common stock, but he cannot introduce a member into the company; in a joint-stock company, his situation is the reverse: he cannot demand his share, but he may transfer it to another. The value of this share, moreover, is uncertain; being that which it will bring at market. 2. In a private copartnery, each partner is bound for the debts contracted by the company to the whole extent of his fortune; in a joint-stock company, on the contrary, each partner is bound only to the extent of his share. The trade of a joint-stock company is always managed by a court of directors. See *East-India company*, *South-sea company*, and *Hudson's-bay company*.

Company, in military affairs, a small body of foot, consisting of from 50 to 100 privates, commanded by a captain, who has under him a lieutenant and ensign. A battalion contains, 9, 10, or 11 such companies, one of which is always of grenadiers. Companies not incorporated are called *irregulars*, or *independent companies*.

Comparative *anatomy*, otherwise called the anatomy of beasts, and sometimes zoötomy, and named *comparative* in relation to that of the human body; a study which affords considerable advantages. 1. It conveys such knowledge of the different parts of animals as detects imposition in those authors that have delineated and described parts of brutes as belonging to the human body. 2. It interprets several passages in ancient writers in medicine who have reasoned from those descriptions. 3. It casts considerable light, sometimes by similarity,

and sometimes by contrast, on the functions of the human frame.

Compass, or *mariner's steering compass*, is an instrument used at sea to direct the course of ships, by ascertaining the situation of a given point, and thence enabling the seaman to pursue a line in any direction to or from it. The European compass is contained in a circular box of brass, and consists of the magnetic needle, and a card marked with the 32 points, so fixed as to turn freely, and, together with the pin in the centre, yield to the motion of the vessel. In the centre of the needle is fixed a brass conical socket or cup, by means of which, the card hanging on the pin turns freely round the centre. The top of the box is covered with a glass, that the card's motion may not be disturbed by the wind. The whole is inclosed in a box of wood, where it is suspended by brass hoops, or gimbals, to preserve the card in an horizontal position. The utility of this instrument results from the magnetic virtue of the needle, through which it constantly places itself in a direct line from pole to pole; a small declination peculiar to various parts of the world, excepted. The compass appears to have been first known about the thirteenth century; but whether it was then discovered by a Neapolitan, a Frenchman, or an Englishman, or brought from China by a Venetian, is not wholly agreed. From some particulars mentioned in the account of the late British embassy to Pekin, it seems reasonable to conclude that, at least, the Chinese did not receive this contrivance from Europeans. 1. The loadstone and its maritime use appears to have been anciently known to that people, because, in a figure of Nep-

tune, it is placed in one of the hands of the god, as we place a trident; 2. The Chinese pilots speak of the needle as pointing to the South pole, and Europeans, as pointing to the North. Both these expressions are equally just: but it commonly happens that when any thing of importance is borrowed from one nation by another, all the little attendant circumstances are taken with it. This latter argument equally maintains, with whatever conclusiveness it possesses, the originality of the European compass: Mr. Barrow, however a gentleman who attended the embassy, has made some observation from which it appears, that that of the Chinese is the more perfect of the two. He describes a sort of bandage of copper, by means of which the declination or variation of the needle is prevented. See MAGNETISM.

COMPASS *Azimuth*, an instrument used for correcting the mariner's compass, or at least, for ascertaining its variation, by finding the sun's magnetical azimuth or altitude. See *Azimuth*, and *Variation of the needle*.

COMPASSION is that species of affection which is excited either by the actual distress of its object, or by some impending calamity which appears inevitable. Compassion is always connected with a desire to relieve, and will always prompt to vigorous exertions wherever there is a possibility of success; unless some important considerations should render the exertions improper or unjust. Compassion has no necessary connection with the character of the object. Its distress is a sufficient excitement.

COMPENSATION is a contrivance in a pendulum

clock, by means of which, while the expansion from increase of temperature depresses the centre of gravity of some of the vibrating parts, other parts are made to ascend nearer the centre of suspension, or to draw up the pendulum, so as to preserve the centre of oscillation of the compound pendulum at an invariable distance, and in consequence to keep all the vibrations to the same time. Compensation balance in a watch is a contrivance by means of which the errors occasioned by the variation of temperature may be corrected by varying the diameter of the balances.

Complement *of Life*, a term used in the doctrine of annuities by De-Moivre, who denotes by it the number of years which a given life wants of 86, this being taken as the utmost probable extent of life. Thus to a person aged 20 the complement of life is 66: to a person aged 40 the complement of life is 46. Upon this mode half the complement of life is that which persons not very young, nor very old, may expect to enjoy, thus to a person of 20 the expectation of life is $\frac{66}{2} = 33$ years, and to persons of 30 and 40, the expectation of it will be $\frac{56}{2}$ and $\frac{46}{2} = 28$ and 23. To find how long a person of a given age may expect to live; that is, the number of years which persons of this age, taking them, one with another, will actually enjoy, and may be considered as sure of enjoying, those who live beyond that period enjoying as much more time, in proportion to their number, as those who fall short of it enjoy less. Rule. "Take the given

age from 86 and divide the remainder by 2." Life annuities and the expectation of life are not calculated in this way now, but from tables of real observations, nevertheless, the rule just mentioned agrees nearly or within a few months with the deductions taken from such tables, and may always serve in rough calculations.

COMPLEMENT, in astronomy, the distance of a star from the zenith, or the arch comprehended between the place of the star above the horizon and the zenith.

COMPLEMENT, in geometry, is what remains of a quadrant of a circle, or of 90° after any arch is taken away.

COMPLEMENTS of a parallelogram, are the two smaller parallelograms made by drawing two right lines through the point of a diagonal and parallel to the sides of the parallelogram.

COMPLEXION, among physicians, the temperament, habitude, and natural disposition of the body; but, in general use, the word means the colour of the skin. Dr. Hunter has given the following view of the different complexions observable among mankind:

| | |
|---|---|
| *Black.* | Africans under the line, |
| | Inhabitants of New Guinea, |
| | Inhabitants of New Holland. |
| *Swarthy,* | Moors in the north of Africa. |
| | Hottentots in the South of Africa. |
| *Copper-coloured.* | East Indians. |
| *Red-coloured.* | Americans. |
| *Brown coloured.* | Tartars. |
| | Persians, |

| | |
|---|---|
| | Arabs, |
| | Africans on the coast of the Mediterranean, |
| | Chinese. |
| *Brownish.* | *Inhabitants of the South of Europe,* |
| | Sicilians, |
| | *Abyssinians,* |
| | Spaniards, |
| | Turks ; *and likewise* |
| | Samoides *and* |
| | Laplanders. |
| *White.* | *Most of the European nations ; also the* |
| | Georgians, and |
| | Inhabitants of the islands of the Pacific Ocean. |

COMPOSITE order. See ARCHITECTURE.

COMPOSITION of motion, is an assemblage of several directions of motion, resulting from several powers acting in different, though not opposite directions. See MECHANICS.

COMPOST, in agriculture, an artificial manure, contrived with a view to this advantage: that, cheaper and less bulky than the quantity of dung required for an equal extent of soil, it shall yet produce equal effects.

COMPOUND *Interest*, see INTEREST.

CONCENTRATION, the act of increasing the strength of fluids, either by evaporating the water with which spirits or acids are combined, or by exposing them to severe frost, when the water will be frozen and the acid or spirits will be found in the middle of the ice.

Conchology, the study or science of shells or testaceous animals, is a branch of natural history. Shells may be said to constitute a department of rational enquiry worthy the researches of the man of science; and when we consider the amazing diversity of singular and beautiful objects that they embrace, they are such as cannot fail to arrest, in a particular degree, the regard of every observer. The term conchology, comprehends the study of animals which have a testaceous covering, whether inhabitants of the land or the water. Testaceology is a term synonymous with conchology, but is of later origin and application. All testaceous animals are composed of two parts, one of which, the animal itself, is soft and moluscous: the other is the shell or habitation, which is hard, of a stony or calcareous nature, and either partially or entirely covers the animal. The animal is attached to the shell by means of ligaments or muscles. It was long considered as a matter of dispute among naturalists whether the arrangement of shells should be constituted from the animals or their habitation. There is much difficulty in either plan of proceeding; but the latter is now generally adopted, because it is certain that the best characters upon which to found all systems of natural history, must be those most obvious and accessible. All ranks of animals, as nearly as can be with convenience, should be arranged by apparent and external characters.

All shells or testaceous bodies hitherto discovered, may be divided into three principal tribes, which may be denominated univalve, bivalve, and multivalve. Any external part of a shell being of a

testaceous substance, and either itself forming a shield or covering for the animal, as in univalves, or in union with one another, or others connected with a ligament, cartilage, hinge, teeth, or other fastening, is denominated a valve. The shells therefore, consisting of a single piece, are called univalves, those of two parts bivalves, and those of many parts multivalves. Between bivalve and multivalve no distinction is drawn, shells consisting of more than two such parts being called multivalve, without any regard to the number. Linnæus begins with the multivalves and the most complex structure, and ends with those of the simplest form. According to this naturalist the multivalves contain, the chiton, lepas, and pholas: the bivalves contain the mya, solen, tellina, cardium, mactra, donax, venus, spondylus, chama, arca, ostrea, anomia, mytillus, and pinna: and the univalves contain the argonauta, nautilus, conus, cyprœa, bulla, voluta, buccinum, strombus, murex, trochus, turbo, helix, nerita, paliotis, patella, dentalium, serpula, teredo, and sabella. See Shell, Testacea.

Concretions, morbid, in animal economy, hard substances that occasionally make their appearance in different parts of the body, as well in the solids as in those cavities destined to contain fluids: in the first place they are denominated concretions or *ossifications;* in the other *calculi.* See Biliary.

Conductor, in electricity, a term used to denote those substances which are capable of receiving and transmitting electricity, in opposition to electrics, in which the electric fluid may be excited or accumulated. See Electricity.

Cone, a kind of round pyramid, or solid body

having a circle for its base, and its sides are formed by right lines drawn from the circumference of the base to a point at top being the vertex or apex of the cone. Or a cone is a solid figure whose base is a circle, and which is produced by the entire revolution of a right angled triangle about its perpendicular leg. See MENSURATION.

CONFERVA, see BOTANY.

CONFESSION, in the Romish church, the act of acknowledging crimes and errors of conduct to a priest, in private, to the end that due reprehension may be suffered, and pardon obtained. By the canon-law, the priest who reveals what has been confessed to him, from anger, hatred, or even fear of death, is to be degraded.

CONFESSOR, an inferior saint of the Roman church; one who has resolutely stood forward to confess or avow his faith, and endured torture, if not martyrdom for its sake.

*Confessor*, a priest, in the Roman church, who has power to receive confessions and grant absolution.

CONGE *d'elire*, see *Bishop*.

CONGELATION, may be defined the transition of a liquid into a solid state, in consequence of an abstraction of heat: thus metals, oil, water, &c. are said to congeal when they pass from a fluid into a solid state. With regard to fluids, congelation and freezing mean the same thing. Water congeals at 32°, and there are few liquids that will not congeal, if the temperature be brought sufficiently low. The only difficulty is to obtain a temperature equal to the effect; hence it has been inferred that fluidity is the consequence of caloric. See FLUIDITY.

CONGREGATIONALISTS, in church history, a sect of Protestants who reject all church government, except that of a single congregation. In other matters, they agree with the Presbyterians. See PRESBYTERIANS.

CONIC-SECTIONS are such curve lines as are produced by the mutual intersections of a plane and the surface of a solid cone. In different positions of the plane there arise five different figures or sections, viz. the triangle; the circle; the ellipse; the parabola; and the hyperbola: the last three are peculiarly called Conic Sections, to investigate the properties of which is the business of Conics, and this depends on a knowledge of geometry plane and solid. It will be sufficient to our purpose to describe the lines and to shew how they are produced.

If the cutting plane pass through the vertex of the cone and any part of the base, the section so formed will be a triangle, as V A B, figure 1. Plate CONIC SECTIONS. But if the plane cut the cone parallel to the base, the section will be a circle as A B D fig. 2.

In fig. 3 the section A B C is an ellipse, and it is formed by cutting the cone obliquely through both sides making the angle A *z* C.

If the cone be cut by a plane parallel to one of its sides, as in fig. 4 the section A D E is a parabola: here the angle *b* A *z* is equal to B *a z*.

The section is an hyperbola when the cutting plane makes a greater angle with the base than the side of the cone makes; thus in fig. 5. the angle A *b z* is greater than the angle M B Z: and if the plane A D E be continued to cut the opposite cone, this latter section is called the opposite hyperbola to

the former, B *e d* is opposite to A D E. The vertices of any section are the points in which the cutting plane meets the opposite sides of the cone as A, B, in fig. 5, and 3, and A in fig. 4. Of course the ellipse and opposite hyperbolas have each two vertices, but the parabola has only one.

The axis, or transverse diameter of a conic section is the line A B fig. 6 : B B, fig. 7. And A b fig. 8. The centre C is the middle of the axis. In the ellipse the centre is within the curve, in the hyperbola it is without the curve, but in the parabola the centre is infinitely distant from the vertex.

A diameter is any right line drawn through the centre, and terminated on each side by the curve. All the diameters of the parabola are parallel to the axis, and infinitely long, because there is no termination to the line A B fig. 8. The conjugate to any diameter is the line drawn through the centre and parallel to the tangent of the curve at the vertex of the diameter : thus H I, fig. 6, would be parallel to tangents drawn through A or B, and G F is parallel to tangents drawn through D and E, of course H I is conjugate to A B, and G F is conjugate to D E.

An ordinate to a diameter is a line parallel to its conjugate and terminated by the diameter and curve: thus D K and E L are ordinates to the axis A B, fig. 6, 7, and 8. Ordinates are perpendicular to their axis.

An absciss is a part of any diameter contained between its vertex and an ordinate to it ; thus A K, K B are abscisses to the ordinate D K : and D N, N E are abscisses to the ordinate M N. In the

Fig. 1.

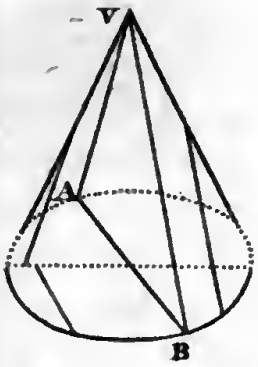



Fig. 2.

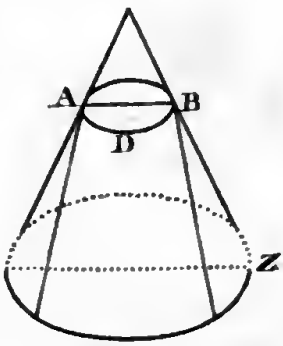



Fig. 3.

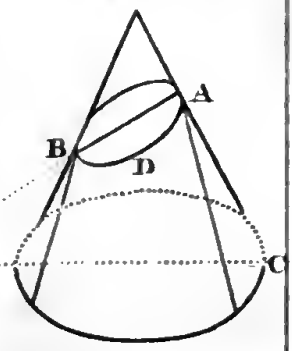



Fig. 4.

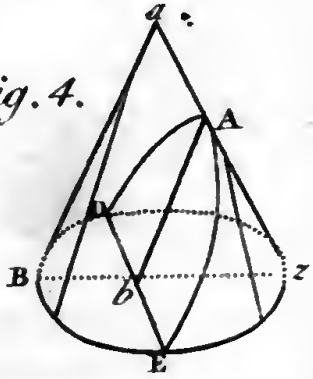



Fig. 6.

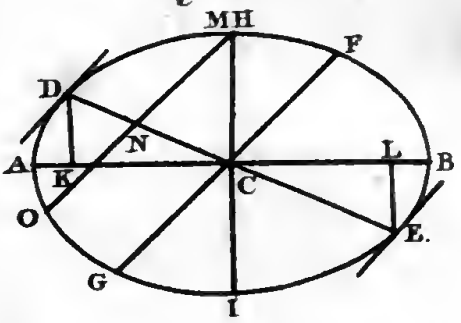



Fig. 7.

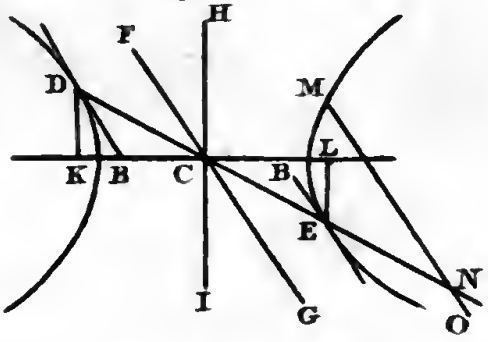



Fig. 5.

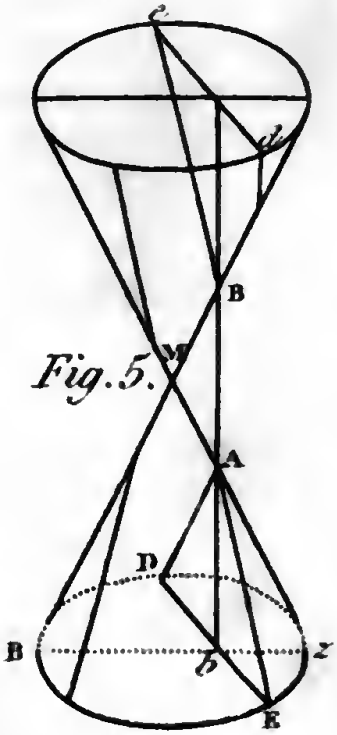
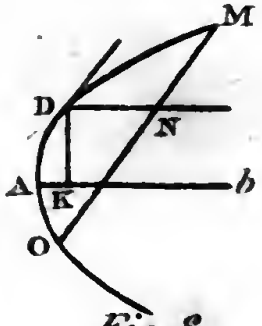



Fig. 8.




Cooper sculp.

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ellipse and hyperbola every ordinate has two abscisses, in the parabola only one.

The parameter, or latus rectum of any diameter is a third proportional to that diameter and its conjugate, thus if the parameter be called $p$, then A B : H I :: H I : $p$. Fig. 6.

The focus is the point in the axis at which the ordinate is equal to half the parameter : the ellipse and hyperbola have two foci, the parabola but one.

There are three methods of investigating and demonstrating the various properties of the conic sections. The first is to consider them, as they really are, cut from the cone itself: by the second method the properties are deduced from arbitrary descriptions of the curves on plane surfaces, and the third is performed by algebraical equations. The doctrine of the Conic Sections is useful in the higher branches of geometry and astronomy.

Connexions, a game at cards, played by either three or four persons. If the former number, ten cards each are to be dealt; if the latter only eight each, which are dealt in the same manner as at whist, and bear the same import, excepting that diamonds are here always trumps.

The " connexions" are formed as follows:
1st, by the two black aces.
2nd, ——— ace of spades and king of hearts.
3rd, ———————— clubs and king of hearts.

For the first connexion two shillings are drawn from the pool; for the second one : and for the third and the winner of the majority sixpence each. These sums suppose guineas staked; but when silver is pooled only pence are drawn.

A trump played in any round where there is a

connexion wins the trice, otherwise it is gained by the player of the first card of connexion, and after a connexion any following player may trump without incurring a revoke, and also whatsoever suit may be led, the person holding a card of connexion is at liberty to play the same, but the others must if possible follow suit, unless one of them can answer the connexion, which should be done in preference.

No money can be drawn till the hands are finished, then the possessors of the connexions are to take first according to the precedence, and those having the majority of tricks take last. PANTALOGIA.

CONSANGUINITY, the relation which subsists between persons who are sprung from the same root. It terminates in the sixth or seventh degree, except in the succession to the crown, in which case it is continued to infinity. Marriage is prohibited by the church to the fourth degree of consanguinity inclusive.

CONSISTORY, an ecclesiastical court or assembly. That of Rome is the college of cardinals, or the pope's senate and council. In England, each archbishop and bishop has a consistory-court, held before his chancellor or commissary, see ARCHBISHOP.

CONSTABLE, in the civil policy of England, an officer under the magistrates for the preservation of the peace, whose duty, at present, principally consists in seizing and securing persons guilty of tumultuary offences. A modern

CONSTABLE-*High*, is chosen or appointed to preside over an hundred, or a franchise or liberty; but the title originally belonged to officers of great rank,

CONSTABLE-*Lord High of England*, a post long

since considered as too powerful to be committed to a subject, and never granted, since the attainder of Edward Stafford, duke of Buckingham, otherwise than temporarily; as, to attend a coronation, or preside at a trial by combat.

Constable-*Lord High of Scotland*, an office which is hereditary in the family of Errol, had the keeping of the king's sword, the unlimited command of the army in the absence of the king, and certain judicial powers. There are also still existing in England and Wales, several

Constables of castles, as of the Tower of London, Dover, Windsor, and Caernarvon castles; and these constables are governors.

Constellation, an assemblage or system of several stars, expressed or represented under the name and figure of some animal or other thing. The division of the starry heavens into constellations is very ancient, probably as old as astronomy itself. Modern astronomers divide the whole starry firmament into three parts, viz. 1. The constellations in the Zodiac. 2. Constellations north of the Zodiac, and 3. Constellations south of the Zodiac. The constellations in the Zodiac are Aries: Taurus: Gemini: Cancer: Leo: Virgo: Libra: Scorpio: Sagittarius: Capricornus: Aquarius: and Pisces: the names and order of these 12 signs may be easily remembered by the aid of the following lines;

The ram, the bull, the heavenly twins,
And next the crab the lion shines,
The virgin and the scales,
The scorpion, archer, and sea-goat,
The man that holds the watering-pot,
And fish with glittering tails.

Consternation is a species of fear, and is a strong foreboding of tremendous evils which are likely to follow misfortunes that have already taken place. It may seize an individual, when surprized by the arrival of some dreadful disaster, or at the instant of his being made acquainted with the event, but it chiefly refers to alarms of a more extensive nature; to some general calamity which threatens evils beyond the power of calculation.

Constitution, in politics, a form or principle of government. Some difference of opinion is entertained concerning the respective advantages of written and unwritten constitutions: the first originating from events, and, frequently, never formally acknowledged; the second depending upon articles carefully drawn, and solemnly acceded to. On this subject, the observations of Mr. Adams, the late president of the United States, appear to be entitled to attention: 'A constitution,' says Mr. Paine, 'is not a thing in name only but in fact. It has not an ideal, but a real existence; and wherever it cannot be produced in a visible form, there is none.' Mr. Paine should have gone farther, and told us, whether like a deed, it must be written on paper or parchment, or whether it has a larger latitude, and may be engraved on stone, or carved in wood? From the tenour of his argument it should seem, that he had only the American constitutions in his mind; for, excepting them, I believe he would not find in all history a government which will come within his definition; and of course, there never was a people that had a constitution, previously to the year 1776. But the word, with an idea affixed to it, had been in use, and commonly

understood, for centuries before that period, and therefore Mr. Paine must, to suit his purpose, alter its acceptations, and in the warmth of his zeal for revolutions, endeavour to bring about a revolution in language also. When all the most illustrious whig writers in England have contended for the liberty of their country upon the principles of the English constitution; when the glorious congress of 1774 declared, that 'the inhabitants of the English colonies in North America were entitled to certain rights by the immutable laws of nature, *the principles of the English constitution* and the several charters or compacts,' they knew very well what they meant, and were perfectly understood by all mankind. Mr. Paine says, that 'a constitution is to a government, what the laws made afterward by that government are to a court of judicature:' but when the American States, by their constitution, expressly adopted *the whole body of the common law*, so far as it was applicable to their respective situations, did they adopt nothing at all, because that law cannot be produced in a visible form? No, the constitution of a country is not the paper or parchment upon which the compact is written; it is the system of fundamental laws, by which the people have consented to be governed, which is always supposed to be impressed upon the mind of every individual, and of which the written or printed copies are nothing more than the evidence."

Mr. Adams has farther illustrated this subject, in the following passage: "It is not absolutely essential to the existence of a constitution, that it should be producible 'in a visible form.' The period of time when the foundations of the present English

government were laid by the association of the people in 'their original character' cannot, indeed, be ascertained. Many of the laws which are in use to this day in Great Britain, and from thence have been adopted by the American republics, may be traced back to the remotest period of antiquity; and the origin even of the institution of juries, an institution so congenial to the genuine spirit of freedom, is lost in the obscurity of the fabulous ages. Many of the fundamental principles of the English constitution are known to have existed long before the invention of printing, and even before the inhabitants of Britain were acquainted with the use of letters, and it would therefore be an absurdity to require that the original articles should be produced 'in a visible form.' But *ex nihilo, nihil fit;* the very existence of these principles proves the formation of a social compact previously to that existence; and the spirit of liberty, which is their distinguishing characteristic, affords internal evidence that they did not originate in the merciless despotism of a conqueror, but in the free and unrestrained consent of a manly and generous people. It will not be said that an original compact was never formed, because it is not recorded in the page of history:—as well might it be pretended, that the pyramids of Egypt arose self-created from the earth, because the time of their erection and the names of their builders have been consigned to that oblivion in which all human labours are destined to be overwhelmed.

"In this sense, the British nation have a constitution, which was, for many years, the admiration of the world. It is composed of a venerable *system*

of unwritten or customary laws, handed down from time immemorial, and sanctioned by the accumulated experience of ages; and of a body of statutes enacted by an authority lawfully competent to that purpose. Mr. Paine is certainly mistaken, when he considers the British government as having originated in the conquest of William of Normandy. This principle of being governed by an oral, or traditionary law, prevailed in England eleven hundred years before that invasion. It has continued to this day, and has been adopted by all the American States, and it is hoped they will never abolish a system so excellent, merely because it cannot be produced in a visible form. The constitution of Great Britain is a constitution of *principles*, not of *articles*; and however frequently it may have been violated by tyrants, monarchical, aristocratical, or democratical, the people have always found it expedient to restore the original foundation, while, from time to time, they have been successful in improving and ornamenting the building."

Constitution, *British*. In this justly-celebrated form of government, power of every kind, and without limit, is vested in the united will of the crown and two houses of parliament: but though the concurrence of the throne is necessary to the measures of each, their functions are distinct; and its perfection consists not only in the equipoise of power between these authorities, but in the strictness with which each is confined to its own boundaries. Under the heads *King*, *Parliament*, *House of Lords*, *House of Commons*, &c. some account is given of the rise, progress, establishment, and nature of that civil liberty which is the constitutional

principle of the British Empire. The acute and animated author of the *Constitution of England*, to whom this book is in several instances indebted, has, in the following paragraphs, given a comprehensive picture of the whole. The subject is here viewed *a priori*; and this, in some cases, is a very useful point of view.

"If we could, for an instant, suppose that the English form of government, instead of having been the effect of a lucky concurrence of fortunate circumstances, had been established from a settled plan, by a man who had discovered beforehand and by reasoning all those advantages resulting from it which we now perceive from experience, and had undertaken to point them out to other men capable of judging of what he said to them, the following is, no doubt, the manner in which he would have spoken to them:

"Nothing is more chimerical," he would have said, "than a state of either total equality or total liberty amongst mankind. In all societies of men, some power will necessarily arise. This power, after gradually becoming confined to a smaller number of persons, will, by a like necessity, at last fall into the hands of a single leader; and these two effects (of which you may see constant examples in history) flowing from the ambition of one part of mankind, and from the various affections and passions of the other, are absolutely unavoidable.

"Let us, therefore, admit this evil at once, since it is impossible to avoid it. Let us, of ourselves, establish a chief among us, since we must, some time or other, submit to one; we shall by this means effectually prevent the conflicts that would arise

among the competitors for that station: but let us, above all, establish him single; lest, after successively raising himself on the ruins of his rivals, he should finally establish himself, whether we will or not, and through a train of the most disadvantageous events.

"Let us even give him every thing we can possibly give without endangering our security. Let us call him our sovereign; let us make him consider the state as being his own patrimony; let us grant him, in short, such personal privileges as none of us can ever hope to rival him in, and we shall find that what we were at first inclined to consider as a great evil, will be in reality a source of advantages to the community—we shall be the better able to set bounds to that power which we shall have thus ascertained and fixed in one place: we shall have the more interested, the man, whom we shall have put in possession of so many advantages, in the faithful discharge of his duty; and we shall have thus procured for each of us, a powerful protector at home, and for the whole community a defender against foreign enemies, superior to all possible temptation of betraying his country.

"You may also have observed," he would continue, "that in all states there naturally arises around the person, or persons, who are invested with the public power, a class of men who, without having any actual share in that power, yet partake of its lustre; who, pretending to be distinguished from the rest of the community, do, from that very circumstance, become distinguished from them: and this distinction, though only matter of opinion,

and at first thus surreptitiously obtained, yet becomes at last the source of very grievous effects.

"Let us therefore regulate this evil, which we cannot entirely prevent. Let us establish the class of men who would otherwise grow up among us without our knowledge, and gradually acquire the most pernicious privileges: let us grant them distinctions that are visible and clearly ascertained; their nature will, by this means, be the better understood, and they will of course be much less likely to become dangerous. By this means also, we shall preclude all other persons from the hopes of usurping them. As to pretend to distinctions can thenceforward be no longer a title to obtain them, every one who shall not be expressly included in their number, must continue to confess himself one of the people; and, just as we said before let us choose ourselves one master that we may not have fifty, so, let us again say on this occasion, let us establish three hundred lords, that we may not have ten thousand nobles.

"Besides, our pride will better reconcile itself to a superiority which it will no longer think of disputing. Nay, as they will themselves see us to be beforehand in acknowledging it, they will think themselves under no necessity of being insolent to furnish us a proof of it. Secure as to their privileges, all violent measures on their part for maintaining, and at last perhaps extending, them will be prevented: they will never combine together with any degree of vehemence, but when they really have cause to think themselves in danger: and by having made them indisputably great men, we shall

have a chance of often seeing them behave like modest and virtuous citizens.

"In fine, by being united in a regular assembly, they will form an intermediate body in the state, that is to say, a very useful part of the government.

"It is also necessary," our lawgiver would farther add, "that we, the people, should have an influence upon the government: it is necessary for our own security; it is no less necessary for the security of the government itself. But experience must have taught you, at the same time, that a great body of men cannot act, without being, though they are not aware of it, the instruments of the designs of a small number of persons; and that the power of the people is never any thing but the power of a few leaders, who, though it may be impossible to tell when, or how, have found means to secure to themselves the direction of its exercise.

"Let us, therefore, be also beforehand with this other inconvenience. Let us effect openly what would, otherwise, take place in secret. Let us intrust our power, before it be taken from us by address. Those whom we shall have expressly made the depositaries of it, being freed from any anxious care about supporting themselves, will have no object but to render it useful. They will stand in awe of us the more, because they will know that they have not imposed upon us; and instead of a small number of leaders who would imagine they derive their whole importance from their own dexterity, we shall have express and acknowledged representatives, who will be accountable to us for the evils of the state.

"But above all, by forming our government of a small number of persons, we shall prevent any disorder that may take place in it, from ever becoming dangerously extensive. Nay, more; we shall render it capable of inestimable combinations and resources, which would be utterly impossible in that government of all, which never can be any thing but uproar and confusion.

"In short, by expressly divesting ourselves of a power of which we should, at best, have only an apparent enjoyment, we shall be entitled to make conditions for ourselves: we shall insist that our liberty be augmented: we shall, above all, reserve to ourselves the right of watching and censuring that administration which will have been established only by our own consent. We shall the better see its defects, because we shall be only spectators of it: we shall correct them the better, because we shall be independent of it."

Consul, in the Roman commonwealth, the title of the two chief magistrates, whose power was, in a certain degree, absolute, but who were chosen only for one year. The authority of the two consuls was equal: yet the Valerian law gave the right of priority to the elder, and the Julian law to him who had the greater number of children; and this was generally called *consul major*, or *prior*.

Consul, in commerce, an officer appointed to reside in foreign countries, to protect the interests of trade. He is to act as a common friend to such of his mercantile countrymen as visit his station. His house is distinguished by the arms of his government placed over the door.

Consul, *First*, an high office, established some

years since as the head of the government of France. It was to be held for ten years, and confer the power of proposing laws, of directing foreign affairs, and of controuling, or managing, the war-department.

Contempt, the act of despising others; scorn; or the state of being despised; vileness. Contempt directs its chief attention to the character and disposition, which are capable of committing unworthy and disgraceful actions. Its objects are radical baseness, and radical imbecility where it should not exist.

Conventicle, in the modern acceptation, a word of contempt, applied by ignorant bigots to a religious assembly of any persuasion differing from that of the church of England. Originally, *conventicle* was the diminutive of *convent;* and signified a party or faction of monks, leaguing for the election of an abbot.

Conveyance, a deed or instrument that passes land, &c. from one person to another.

Conveyancer, one who professes to draw deeds, mortgages, and conveyances of estates. This is one of the most profitable branches of the law, especially when the business of a money-scrivener is super-added; in which latter case, a conveyancer is employed to find estates to purchase, to lay out and borrow money, and in these occupations he is paid by both the contracting parties, and draws the securities. This profession requires great knowledge of the law, and a solid and clear understanding; for on conveyancing the security of property greatly depends.

Convocation, an assembly of the clergy of Eng-

land, at present merely nominal. Its province is stated to be, the enactment of canon-law, subject to the licence of the king; and the examination and censuring of all heretical and schismatical books and persons; but from its judicial proceedings lies an appeal to the king in chancery, or his delegates. In 1665, the convocation then assembled surrendered to parliament the right of taxing the clergy; and ecclesiastical persons in return obtained the right of voting at elections: since which alteration, the convocation has usually been called and dissolved together with the parliaments; but prorogued from time to time through the whole period of its existence.

Cooper, a maker of casks. This hard-working business has several branches. Some casks are tight, for holding liquids, and others not so, for dry goods, package, and soap. The making of soap-casks is the lightest labour, and requires the least capital; that of small light casks is more laborious, and demands a larger fund; that of butts, hogsheads, and large vessels for brewing and other extensive purposes, stands, in both respects, the highest in the scale.

Copal, improperly called gum-copal, a gum of the resinous kind, the concrete juice of a tree called *rhus copallinum*, which grows in New-Spain. It is dissolved in linseed-oil by digestion, with a heat very little less than sufficient to boil or decompose the oil; and the solution, diluted with spirit of turpentine, forms a well-known, transparent varnish.

Copernican *system*. See Solar *system*.

Cophti, or *copts*, a name given to the *jacobites*, a

sect of christians in Egypt. The principal errors in regard to doctrine, of which they are accused by the Roman church, are, 1. The acknowledgement of seven sacraments. 2. The denial of the proceeding of the Holy-Spirit from the Son; 3. The allowance of three general councils of the church; 4. The allowance of one nature, will, and operation in Jesus Christ, after the union of the humanity with the godhead. In point of discipline, they ordain deacons of five years of age; and allow marriage in the second degree of affinity. The church-government of the jacobites is episcopal; and the sect appears to differ but little from the Greek-church; it has, however, a patriarch of its own. The other christians of Egypt are called *melchites*.

Copper, the finest of the imperfect metals. It has obtained the name *Venus*, on account of its readiness to unite with several metallic substances. Native copper is found in Sumatra, it is picked up in loose masses, on the hills shattered by earthquakes, which are very prevalent in that island. The natives are ignorant of mining; but Mr. Macdonald supposes that its mountains contain inexhaustible stores of this mineral. On smelting it, a considerable portion of gold is found to be included in the ore. Paris-mountain, in the isle of Anglesea, is famous for its copper-works. A method of obtaining fine copper from springs that, according to common expression, turn iron into that metal, has been known for centuries in Germany, and, within these few years, practised in the united kingdom. The explanation of this circumstance is, that the iron is dissolved by the vitriolic acid of the springs in question, and the copper precipitated in

its metallic form in place of the iron. The present bishop of Llandaff relates that at the copper-mines at Arklow, in Ireland, one of the workmen having left an iron shovel in a stream that issues from the works, he found it, after having lain there some weeks, so incrusted with a coat of copper, that it was at first believed to be changed into that metal. The proprietors of the mines, in pursuance of the hint, made proper pits and receptacles for the water, and obtained, by means of soft iron bars put into them, such quantities of copper that the streams are now of equal value with the mines themselves. One ton of iron produces nearly two tons of copper-mud; and each ton of mud, when melted, sixteen hundred weight of copper: and the metal thus obtained sells for £10 a ton more than that fluxed from the ore. The lessees of the Paris mines, annually raise from six to seven thousand tons of saleable ore, and daily employ forty furnaces in smelting it. This ore contains a large proportion of sulphur, which must be separated by *roasting*, before it can be melted, or, technically speaking, *fluxed*. The inflammable chemical liquor, with part of the vitriolic acid it contains, are dispersed in the air by the force of the fire; while another part of the acid attacks and dissolves so much of the copper, that the water in which the *roasted* ore is washed, has yielded, in one year, iron being immersed, an hundred tons of fine copper. Copper is injurious to the animal system. See Poison.

Copper-plate. See Engraving.

Copper-plate, printing. See Printing.

Copperas, is the sulphate of iron, and is commonly called green vitriol. If sulphuric acid be diluted

with water, and be poured upon iron, much effervescence will be seen; the metal will be dissolved, and the solution, when evaporated, will exhibit the sulphate of iron, or common copperas, which is a neutral salt in a very impure state. Copperas is the basis of many dyes: it gives a fine black, though it rather subjects the material to decay, unless used with extreme caution, the least excess occasioning the cloth, &c. to rot very soon. It seems that wool is more affected by it than felt, as is obvious from the greater duration of hats beyond what broad cloths, &c. exhibit when dyed black. Ink owes its rich blackness principally to the copperas which it contains; and our fine black leathers are equally indebted to its powerful qualities, that so firmly fix the colour on all occasions. Many servants are in the habit of cleansing their copper kitchen-utensils with green vitriol, which is extremely dangerous: the copperas is highly corrosive, and disengages a very large portion of the copper, which cannot be always removed, even when much pains are taken, the salt being buried under projecting rims, rivets, &c. We are apt to believe that many most painful and dangerous complaints have resulted from this, though probably they may have been assigned to other supposed causes.

Copy-*hold*, a sort of tenure of landed property, according to the custom of the manor, the holder of which is subject to certain services and fines, and has no other authority for his possession than the copy of the court-roll made by the steward of the lord's court. A copy-hold is taken either in fee-

simple, fee-tail, for life, years, or at will; but generally in fee or for three lives.

Coral, or *corallina*, a marine production, concerning which it is by no means agreed whether it be animal or vegetable. The species are several, distinguished by the form of their branches; and they are found adhering to shells, rocks, &c. Mr. Macdonald, in a paper on the coral of Sumatra, in the fourth volume of the *Asiatic Researches*, after referring that species of plant, as he denominates it, to the class of *Cryptogamia* of Linnæus, observes, that it differs from the descriptions of coral hitherto given, and, therefore, obliges us with the following account of it: "It is of three colours; red, black, and whitish-yellow; the last is the most common in the eastern seas. It is of a fungous texture, equally hard in and out of its natural element; and its pores are charged with a juice of a milky appearance, in some degree acrid. The bark covers every part of the tree, and contains a number of perforated papillæ, or pores, terminating in tubes. The internal projections of the papillæ adhere to the particles of sand and stone, on which the coral grows, and are the only appearance of roots it exhibits." The tree, in general, he observes, grows to the height of two feet, but in some instances to that of ten. From its rapid growth on the western coast of Sumatra, he thinks that the coral ought undoubtedly to rank as a vegetable: yet modern naturalists seem to have determined differently concerning this production of the ocean; some affirming it to be a fossil, formed like crystals and spars, while others rank it among the animal tribes. Sir

William Jones, in an additional note, defines corals and

Corallines, according to the approved system of Ellis, as the cretaceous habitations of animals, and one of the links in the great chain of nature. Mr. Macdonald's notion, that an artificial island, for the purpose of safe anchorage, might in time be produced from a quantity of corals, mixed with stones and other substances, transported to the coast of Coromandel, and sunk at the mouth of the dangerous part of Madras, is a very ingenious one, were it practicable; but sir William remarks, that it would, in all probability, occasion, from its quick increase, a dangerous reef of rocks, before that island could be formed.

Cordage, a term used for all sorts of cord of every size. Cords were originally made of leather, or the hides of animals: these gave way in this country to the use of iron chains. In more distant nations to the south; thongs and chains were superceded by the use of vegetable shreads, and the arts of combining them into strength. The junci or rushes, in later times were worked up into cordage, by our own ancestors, and hence, perhaps, old cables, and ropes, are now called "old junk."

Cordwainer, the term whereby the statutes denominate a shoemaker. The word is from the French *cordouannier*, which Menage derives from *cordouan*, a kind of leather brought from Cordova, Cordona, or Cordua, a city of Andalusia. The shoemakers of London are incorporated under the name of the "company of cordwainers."

Coridor, in architecture, a gallery leading to

several chambers, sometimes wholly inclosed, and sometimes open on one side.

CORINTHIAN *order*. See ARCHITECTURE.

CORINTHIANS, epistles to the, in the New Testament, are two letters addressed by the apostle Paul to the inhabitants of Corinth. The first was probably written from Ephesus about the year 56, in answer to some queries proposed by the Corinthians, and to correct some abuses and disorders which had crept in among them during his absence. The second was written about a year or two later, and upon similar topics.

CORK, the bark of the cork-tree, a species of *quercus*, or *oak*, growing, in great abundance, in Spain, Italy, and France. The bark is taken from the tree by making an incision down the whole height of the trunk, and, at each extremity, another round the girth. The tree is supplied with this coat in a degree so peculiarly abundant, that not only it continues to flourish uninjured by the act of barking, but, in its natural state, regularly sheds the whole, and acquires a new covering. The pieces of bark are flattened artificially, by placing them in water, and under heavy stones. The Spaniards employ them to line stone-walls, where they contribute to warmth, and absorb moisture. Imported into England, this substance furnishes employment to the

CORK-*cutter*, by whom it is half-burnt, and then, with a sharp knife, cut into pieces adapted, by their soft yet firm texture, for closing liquor-vessels. The workers at this business, which is sedentary, and simple in its operation, are frequently women,

who earn 7, 8, or 10*s.* a week. Cork is also applied to a few other purposes: among which the most remarkable is that of

Cork-*jackets*; from the buoyant nature of which, it is asserted, its wearer cannot possibly sink while it adheres to him. Provided with this valuable apparatus, neither strength, nor skill, nor courage, are said to be necessary; and a young lady may safely venture into even a rough sea.

Corn, farinaceous seed, as that of wheat, rye, barley, millet, rice, oats, maize, lentils, peas, or other plants. Anciently, men ate acorns, and the nuts, or mast, of the beech. The first cultivation of fields of corn was certainly a signal event in human history; but its date is wholly lost. Agriculture gives a new character to the species; and strikingly distinguishes its professors, not only from the animal race in general, but from those men who still, like that, subsist on the spontaneous productions of nature. Ceres, whose memory the poets have enveloped in fable, appears, if not to have invented the practice, at least to have introduced it into Greece, and other nations of that age and region. See Bread and Food.

Corns, in surgery, hard excrescences on the feet, occasioned by the pressure of shoes. Mr. Anthony Carlisle, surgeon to the Westminster-hospital, in the seventh volume of *Medical Facts*, gives an ingenious account of the formation and texture of the cuticle, and thence proceeds to show the cause of corns. The cuticle, which is formed, he thinks, of coagulate lymph, is composed of laminæ of different degrees of thickness. When injured by pressure, the most usual cause of corns, it is

thrust off by new layers of cuticle, formed underneath it; if the new layer be formed before the old one loses its hold, the two will be interwoven together; and if the pressure which occasioned the injury be continued, new layers will go on to be formed, and at length the true-skin will be removed by absorption, thus allowing the diseased mass of cuticle to sink below the level of the living parts; hence a cone of cuticle is formed, with its apex protruded among sensible substances. Corns may be dissolved, by first soaking in warm water, and afterwards applying the liquid caustic alkali. The management of this process, he says, requires some address, and often considerable patience and perseverance. A more tedious method is by the application of adhesive plaster, spread on leather, having a hole in the centre; by this means, a pressure is made on the parts round the corn, by which the root will in time be protruded. This process is perfectly safe, but often requires five or six weeks for its accomplishment. A third method is by blister: the corn is to be cut close, and then a strong blistering-plaster is to be applied, extending a little beyond its circumference. This is particularly used for soft corns.

Cornelian. See Carnelian.

Cornet, in military economy, the third officer of a large company of cavalry, who bears the colours, and commands in the absence of a lieutenant.

Cornucopia, the *horn of plenty*, or *Amalthea's* horn, a source whence, according to the ancient poets, every production of the earth was lavished; a gift from Jupiter to his nurse, the goat Amalthea. In elucidation of this fable, it has been said

that in Lybia, the ancient name of a part of Africa, there was a little territory, in shape not ill-resembling a bullock's horn, which Ammon, the king, gave to his daughter, Amalthea, the nurse of Jupiter.

COROL or corolla, see BOTANY.

COROLLARY, is an useful consequence drawn from something already advanced or demonstrated: thus it being demonstrated that a triangle which has two equal sides, has also two angles equal; this corollary will follow, that a triangle which has its three sides equal, has also its three angles equal.

CORONER, an officer in the British polity, whose duties are somewhat of the nature of those of a sheriff. Each county, however, has several coroners, in some instances to the number of six. A coroner is to inquire, with the assistance of a jury, into the cause of the death of any person dying by unnatural means, or in prison. If, by this inquest of murder, suspicion is found to attach to any one, he is to commit the suspected party for farther trial. He takes cognizance of goods brought on shore by shipwreck; and of all treasure-trove or property found and unclaimed. A coroner is also a substitute for the sheriff; and is to act whenever that officer is supposed to be interested in a process.

CORONET, an inferior crown worn by the nobility. See HERALDRY.

CORPORAL, in military economy, an inferior officer, under a serjeant, in a company of foot, who has charge over one of the divisions, places and relieves centinels, and keeps good order. His pay is about one third more than that of a private, above whom he is the first gradation.

CORPORATION, a body politic or incorporate, so called, because the persons or members are joined in one body, and thus qualified to take, grant, and do any other act necessary to the common concern. By means of corporations, powers and properties are erected and perpetuated independently of the individuals incorporated. The utility of these institutions may be illustrated by the case of a church-living. At the original endowment of parish churches, the freehold of the church, the church-yard, the parsonage-house, the glebe, and the tythes of the parish were vested in the then parson by the bounty of the donor, as a temporal recompence for his spiritual care of the inhabitants, and with the intention that the same emoluments should ever after continue as a return for the same exertions. How, then, was this to be effected? The freehold was vested in the parson; and if we suppose it vested in his natural capacity, on his death it might descend to his heir, and would be liable to his debts and incumbrances; or, at best, the heir might be compellable, at some trouble and expense, to convey these rights to the succeeding incumbent. The law therefore has wisely ordained that the parson, *as parson*, shall, like the king, *as king*, never die; and this is done, by rendering the successive possessors of the living a body corporate. By this means, all the rights of the parsonage are preserved entire to the successor; the present incumbent, and his predecessor who lived seven centuries ago being, in law, one and the same person, so that what was given to the one was given to the other also.—Corporations exist in such great numbers, and for so various purposes

(as municipal government, charity, church-property, learning, trade, &c.), that they cannot here be enumerated. They are described as either *aggregate* or *sole*; that is, including many members or one: the former are generally known; and the latter is that of which a church-living presents an example.

Correction. See Printers' marks.

Corruption of *blood*, in law, an infection accruing to a man's state, attainted of felony and treason, and to his issue, for as he loses all to the prince, his issue cannot be heirs to him, or to any other ancestor by him, and if he be *noble*, his heirs will lose their right to the title.

Corsair, a cruiser, a name commonly given to the piratical cruising-vessels of Barbary, which, since the beginning of the sixteenth century, have infested the Mediterranean.

Cortes, a Spanish term signifying the states or assembly of the states: they were formerly held at Madrid, but since the invasion of Bonaparte, and the usurpation of his brother, the Cortes have been moveable, and have fled from place to place out of the reach of the tyrant.

Corypha, the umbrella tree, grows as tall as a ship's mast, and has the largest leaves of any vegetable, being of a size to cover twenty men. These are used as paper, they serve also for covering houses in the room of slates. Most of the books which are shown in Europe for the Egyptian Papyrus are made from the leaves of this tree, which is called likewise the fan-palm on account of the leaves folding, when dry, like a fan.

Cosmogony, in physics, the science or theory of the formation of the world.

Cosmography, the description of the world.

Cotton. See Gossypium.

Cotyledon. A seed consists of three parts: viz. the cotyledons, the radicle, and the plumula, which are usually inclosed in a cover. If we take a garden bean, we may perceive each of these three parts with great ease; for this seed is of so large a size, that all its organs are exceedingly distinct, when we strip off the external coats of the bean, which are two, and of different degrees of thickness in different parts, we find that it easily divides into two lobes, pretty nearly of the same size and figure. Each of these lobes is called a cotyledon.

Covenant, in law, the agreement or consent of two or more by deed in writing, sealed and delivered; whereby either, or one of the parties, promises to the other that something is already done, or shall be hereafter done: he that makes the covenant, is called the covenanter, and he to whom it is made is denominated the covenantee.

Couchant, in heraldry, is understood of a lion, or other beast, when lying down, but with his head raised, which distinguishes the posture of couchant from dormant, whereon he is supposed quite stretched out and asleep.

Council, in national affairs, an assembly of persons for the purpose of concerting measures of state. See King.

Council *Aulic*. See Aulic.

Council-*Common*, in London, a court consisting of the lord-mayor, aldermen, and common-councilmen, or representatives of the body of citizens

elected by the several wards, by which all by-laws or regulations for that city are made.

Council *of war*, an assembly of the principal officers of a fleet or army, called by the admiral or general to concert measures for requisite operations.

County, in geography, originally signified the territory or jurisdiction of a count or earl; but the word is now used in the same sense with shire. In this view, a county is a circuit or portion of the realm, into fifty-two of which England and Wales are divided for the better government, and the more easy administration of justice. See Justice.

County-*palatine*. See Palatine.

County-*corporate*, a title given to several cities or ancient boroughs (as Southampton and Bristol), on which certain kings of England have thought proper to bestow peculiar privileges; annexing territory, land, or jurisdiction, and making them counties within themselves, with their own sheriffs and other officers.

Courage is such a firmness of mind, inspired by a sense of what is just and honourable, as amidst all the dangers and evils to which human life is incident, enables a man steadily to pursue the dictates of conscience and prudence.

Court-*baron*, a court held by the steward within every manor. This court is of two natures; the one a customary court, appertaining entirely to the business of the copyholders [see Copyholder]; the other a court of common law, in which the *barons*, or freeholders of the manor, as the *pares* or peers of each other, sit in judgment, the steward being rather the registrar than the judge. This court is competent to try, by "*writ of right*," all contro-

versies relating to the right of lands within the manor, and also personal actions of debt or trespass, where the debt or damages do not amount to forty shillings: but the *writ of right* may be removed into the county-court; and all other actions into superior courts.

Crab, in astronomy, and natural history. See Cancer.

Crane, a machine used in building, on wharfs and in warehouses, for raising and lowering huge stones, ponderous weights, packages, &c.

Craniology, a system of physiognomy, invented by Dr. Gall of Vienna. The chief principles on which this is founded are. (1) That the brain is the material organ of the internal faculties. (2) That it contains different organs for different faculties. (3) That we may judge of these different organs and their faculties by the exterior form of the cranium: in other words the formation of the cranium depends on the portion and prominencies of the brain, producing corresponding impressions and indentations.

Crape, a light transparent stuff, in manner of gauze, made of raw silk, gummed and twisted on the mill, and much used in mourning. The invention came from Bologna; but the chief manufacture of this stuff is said to be at Lyons, in France, and at Norwich in England.

Crayon, a general name for all coloured stones, or other minerals and substances, used in designing or painting in pastel; whether they have been beaten and reduced to a paste, or are used in their primitive consistence, after sawing or cutting them into long narrow slips. In this last manner are red

crayons made of blood-stone or red-chalk, and black ones of charcoal and black-lead. Crayons of all other colours are compositions of earths reduced to paste. In painting with crayons, the artist should be apprized of one essential difference which should be observed between the application of colours in crayons and that of colours in oil. Colours used in a dry state have a much greater warmth of complexion than those in a wet one. For this reason, in order to produce a rich picture, a much greater proportion of what painters call "cooling tints," must be applied in crayon-painting than would be adviseable in oil. To the absence of this consideration, it may be fairly attributed that many oil-painters have attempted crayons with but little success; and that crayon-painters, used to tints that, when wet, are of a cold nature, are apt to introduce them too abundantly when they paint in oil.

CREST. See HERALDRY.

CREUX, a term in sculpture, used by the French in a sense for which there is no corresponding term in the English language. Originally it signified a *hollow*, or *cavity;* and in sculpture it is applied where the lines and figures are cut below the surface of the substances engraved, and thus stands opposed to *relievos*, which latter term intimates the prominence of the lines and figures above the surface.

CRICKET, an active or manly game, played with bats and a ball, and which is almost peculiar to this country. The number of the party on each side is 11, who alternately take the innings, and alternately the bowling and watching. The essence of the game consists on the one side in an endeavour to knock down the wickets by bowling the ball from one wicket

to the other, or in endeavours to catch the ball when struck by those who manage the bats in defending the wickets against its attack; on the other, by striking the ball in such a manner as not to endanger its being caught, and to such a distance as to allow the batters to run and exchange wickets before the ball is returned to either of the bowlers, so that either of the wickets may be knocked down while one of the batters is absent from it, at more than the distance of the length of his bat. Every run from wicket to wicket constitutes a notch, and the game is decided by the number of notches obtained by one party over the other upon two innings of both.

Crim *Tartary*, or Crimea, the ancient Taurica Chersonesus, is a peninsula lying in the Black sea, by which it is bounded on the west and south: on the east by Circassia, and on the north by the Palus Mæotis, or sea of Asoph. It is situated between 44 and 46 degrees of north latitude, and between 40 and 44 degrees of east longitude. The chan of the Crim Tartars is dependent in a good measure on the Turks, whom he is obliged to furnish with 30,000 men when required. The chief trade of the Tartars is in slaves; and in exchange for these, they receive rice, coffee, raisins, dates and clothing.

Crime, an offence. The subject of crimes and punishments, so intimately connected with the good order of society, is naturally an interesting one to all persons of reflection. It is notorious that many nations have laws indefensible upon any right view of this matter; and still more so, that the opinions and judgments of individuals are frequently in the last degree incorrect. To enter into the subject, the

limits of this work will not permit; all that can be allowed is the insertion of a few hints that may assist a methodical survey of this important topic. Under the heads LAW, and PUNISHMENT, are some observations connected with this inquiry. Here, it will be only attempted to exhibit the nature of CRIMES in a perspicuous point of view. It is only the offences against society that shall be spoken of in this place: the rest are not within the province of the legislator; but are against our Creator, and belong to *religion*, or against ourselves or immediate connections, and belong to *morals*. These latter are to be corrected by the priest or the philosopher; the former are amenable to law, and should be considered and punished as proceeding from one of the following sources:

| Whence | |
|---|---|
| I. DISAFFECTION to a governing power, | 1. Sedition,<br>2. Treason. |
| II. INDOLENCE, or inaccurate ideas of, the right of property, or absolute want, | 1. Pilfering,<br>2. Pilfering, with breach of confidence,<br>3. Highway robbery,<br>4. Burglary,<br>5. Fraud, &c. |
| III. FEROCITY, or uncurbed passion, | 1. Wantonly doing that which may injure others,<br>2. Breach of the peace,<br>3. Maiming,<br>4. Manslaughter, murder, &c. |
| IV. MALICE, | 1. Injuries wholly malicious; that is, where the culprit has proposed no benefit to himself, or any other;<br>2. Murder. |

It may also be added, in distinguishing between words often esteemed synonymous, that actions contrary to the precepts of religion are called "sins:" actions contrary to the principles of morals are called "vices;" and actions, contrary to the laws of the state, are called "crimes." A sin, a vice, a crime, are therefore evidently the objects of theology, ethics, and jurisprudence.

CRITICAL *days*, are those on which it has been supposed the termination of diseases, and especially of continued fevers, has happened, these are the third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, and twentieth.

CROCODILE, *fossil*, one of the greatest curiosities which later ages have produced. It is the skeleton of a large crocodile, almost entire, found at a great depth under ground, and bedded in stone. It was discovered in the side of a large mountain in the midland part of Germany. It had the back and ribs very plain, and was of a much deeper black than the rest of the stone, as is the case in the fossile fishes which are preserved in this manner. The part of the stone in which the head lay was not found, this being broken off just at the shoulder, but that irregularly, so that in one place a part of the head was visible in its natural form. The two shoulder bones were very fair, and three of the feet were well preserved; the legs were of their natural shape and size, and the feet preserved even to the extremities of the five toes on each of them.

CROISADE, or crusade (from *croix*, French, *crux*, Latin), in the ancient history of Europe, a military expedition of the Christians against the infidels of Palestine, for the conquest of that country. The

croisades took place between the years 1096 and 1291; in which latter year the town of Acra was taken by the soldan or sultan of Egypt, and the Christians entirely driven out of Syria. These expeditions are generally spoken of by Protestants with indiscriminate abuse; but, considering what human history is, they do not, it may appear to impartial eyes, fill a page peculiarly marked with absurdity and blood-shed. War was the business of the barbarians by whom they were undertaken; and the religious ideas they had received were certainly such as to excite and justly the most enthusiastic actions. On the side of the assailants only, two millions of lives are, indeed, computed to have been sacrificed; thousands of children were led to perish, or to be sold for slaves by their schoolmasters, in the Holy-Land, deluded by the sophistical application of the words, "out of the mouths of babes and sucklings hast thou perfected praise;" with these and a thousand other disasters they may doubtlessly be reproached: that their crimes were such as to impress the Mahometan nations with lasting hatred of the Christian name may also be allowed; that their internal-quarrels rendered them dispicable foes, and their ferocious manners, infamous conquerors, cannot be denied: but their cruelty was the cruelty of zealots, the dictation of ignorance. When by the result of temporary success, Jerusalem fell into their hands, the garrison was put to the sword, and the inhabitants, men, women, sucking children, massacred without distinction; and defenceless females butchered in the caves to which they had fled for refuge: yet these were not the actions of Atheists,

of men who set Heaven at defiance, or of monsters, without regard, without affection, for their fellow creatures, or even high notions of moral rectitude; these were the gallant knights of whom christendom has boasted, and of whom she continues to boast; these were they whom so many maidens loved, and by whom so many maidens were protected; and who, even in the very moment of their fury, marched over its dying victims toward the holy sepulchre, and there, while the blood was yet warm on their hands, sung anthems to the Son of God, and burst into tears of gratitude for their victory. Of the turpitude of the croisaders, something is to be attributed to the age, and something to zeal, which never yet was in arms without being ferocious; and posterity may forgive the men by whom, through the energies which they called into action and the learning and refinement which they were the means of bringing from the countries they ravaged, it has been taught to perceive and renounce the errors of which they were guilty.

Cromlech, a term known in British Antiquities to denote large, broad, flat stones raised upon other stones set up to support them. They are common in Anglesea, and are by some supposed to be remains of sepulchres, by others to be altars. They may indeed have been both, being originally reared as tombs, and afterwards used as altars.

Cross, instead of a signature in writing, is derived from the Saxon custom of affixing the sign of the cross, whether the affixer could write or otherwise.

Cross-bow, also called the *arbalest*, receives the former name from its figure; the machine con-

sisting of a steel-bow, fixed at the end of a short shaft or stock, furnished with a string or trigger. It serves to expel bullets, stones, arrows, and darts.

CROTALUS, the rattle-snake, a genus of serpents furnished with poisonous fangs. The serpents of this family seldom bite except when irritated, or for the purpose of securing their prey. Their possession of the fascinating power which has been attributed to them is uncertain; the fact, that small birds, squirrels and leverets, descend spontaneously, from the branches of the tree under which the rattle snake lies, and are devoured by it, seems to be generally admitted, though it is very difficult to be accounted for. The more common opinion is that the animals thus devoured are in the first place terrified by the noise of the snake's rattle, and hence lose all power of self-government, or continue to fly from branch to branch till they are so exhausted as to be compelled to fall down within its reach. The rattle consists of hollow, hard, dry, and semi-transparent bones resembling in some measure, the shape of the human *os sacrum*: the tip of every uppermost bone runs within two of the bones below it; by which contrivance they have not only a moveable coherence, but also are enabled to make a more multiplied sound, each bone hitting against the other two at the same time. The number of joints in the rattle of individuals is various, from five to forty. The poisonous secretion is discharged from the fangs of the dog teeth, or tusks placed without the upper jaws, after the manner of the viper, and after the first time the animal seems progressively to lose its power of poisoning, till it has had time to recruit itself by a respite of some hours: so that the

second bite, if given immediately after the first, does not prove so injurious, the third still less so, and the fourth does, perhaps, scarcely any mischief at all.

Croton, or wild ricinus, is a botanical genus containing 51 species, of which may be noticed, the *croton tinctorium*, or turnsole, which is used as a colouring matter in various arts and chemical processes: the substance thus used is found between the empalement and the seeds: *croton sebiferum*, or tallow tree, is a native of China, about the size of a cherry tree. The fruit is enclosed in a pod, and consists of three round white grains of the size of an ordinary hazel nut, with a small stone in the interior. From the kernels or expressed oil, the Chinese obtain tallow, of which they make their candles.

Crotophaga, a genus of birds, natives of South America, noticed on account of a curious peculiarity belonging to the females, several of which lay their eggs in the same nest, which is the united work of them all. Each contributes, likewise, her share to the general process of incubation, and to provide food for the common family. These birds are said to pick out the acari from the backs of cattle infested with them, for which purpose, they lie down spontaneously.

Crown, an ornament worn on the head by kings, sovereign princes, and nobles, as a mark of dignity. In heraldry, it is used for the representation of that ornament in the mantling of an armory to express the dignity of persons. The Romans had various kinds of crowns, as 1. The oval crown, made of myrtle, and bestowed on victorious generals: 2.

The naval crown, composed of a circle of gold, with ornaments representing the beaks of ships, and given to the officers or men who first boarded an enemy's ship. 3. The crown given as a reward to him who first forced the enemy's entrenchments. 4. The mural crown, given to him who first mounted the wall of a besieged place, and there lodged a standard. 5. The civic crown, made of the branch of a green oak, and given him who had saved the life of a citizen. These and other crowns were given as marks of honour, and upon competitions with rivals for rank and dignity often determined the preference in their favour.

Crown-*Office*. The court of king's bench is divided into the plea-side and the crown side. In the *plea* side it takes cognizance of civil causes, in the *crown* side it takes cognizance of criminal causes, and is therefore called the crown office. In the crown office are exhibited informations in the name of the king, of which there are two kinds, 1. Those filed *ex officio* by the king's attorney general. These are properly the king's own suits. 2. Those in which, though the king is the nominal prosecutor, yet, it is done at the instance of some private person or common informer; these are usually filed by the master of the crown office.

Crucible, a vessel made of earth, and so tempered and baked as to indure the greatest fire. It is used in chemical operations, and by workers in gold and silver. See Chemical Apparatus.

Cruiser, from the German *kruiss*, "across," a small armed vessel that sails to and fro in quest of the enemy, and to secure those of its own nation.

Crusade. See Croisade.

Cruor, sometimes signifies the blood in general; sometimes only the venous blood, and at others extravasated or coagulated blood; but the word is most frequently used for the red globules of blood, in contradistinction to the limpid or serous part.

Crustaceous fish, are those covered with shells consisting of several pieces or scales, as those of crabs, lobsters, &c. These are generally softer than the shells of the testaceous fish, which consist of a single piece, and commonly thicker and stronger than the former, such as those of the oyster, scallop, cockle, &c. The crustacea consist almost entirely of the three tribes, viz. cancer, oniscus, and monoculus.

Cryptogamia, the 24th class of vegetables in the Linnæan system; comprehending those whose fructification is concealed or inconspicuous, as ferns, mosses, liverworts, and mushrooms. See Botany.

Crystal, a species of stones of the quartz kind, belonging to the siliceous class. When no accidental circumstance has interrupted the crystalization (for it must once have been in a soft state), it is always of an hexagonal (six-sided) angular form, pointed at both ends. Crystal is found of various colours. It is frequently cut; and lustres, vases, and toys, are made of this, as of other beautiful stones. In the imperial collection at Vienna, there is a pyramidical, crystal vase, two ells in height, wholly cut out of one crystal.—The formation of crystals is one of the most ordinary operations of nature. This is evident from the sparry stalactitæ (resemblances of icicles) in the arches of modern buildings: particularly Westminster bridge, the

roofs of the arches of which were filled with these spars within a year after they were built.

Cube, a regular solid body, consisting of six square and equal sides, and the angles all right, and therefore equal.

Cube-*root* of any number or quantity, is such a number or quantity as, if multiplied by itself—and then the product thence arising by that number or quantity, being the cube-root—this last product shall be equal to the number or quantity whereof it is the cube root: thus, 2 is the cube-root of 8; because two times two is 4, two times 4 is 8.

Cuckow, a genus of birds belonging to the order of pies or *picæ*. The habit, peculiar to this bird, of laying its egg in the nest of others of different species, is well known; but that the young one is no sooner hatched than all the eggs or young of its foster parents are pushed out to perish together, either entangled about the bush which contains the nest, or scattered on the ground under it, is not, perhaps, of equal notoriety. The following little narrative is extracted from a paper in the *Philosophical Transactions*, by the honourable Daines Barrington: "A hedge-sparrow built her nest in a hawthorn bush in a timber-yard. After she had laid two eggs, a cuckow dropped in a third. The sparrow continued laying as if nothing had happened, till she had laid five, her usual number, and then sat. On inspecting the nest, June 20, 1786, I found that the bird had hatched that morning, and every thing but the young cuckow was thrown out. Under the nest, I found one of the young hedge-sparrows dead, and one egg by the side of the nest entangled with the coarse woody

materials that formed its outside covering. On examining the egg I found one end of the shell a little cracked, and could see that the sparrow it contained was yet alive. It was then restored to the nest, but in a few minutes was thrown out. The egg being suspended by the outside of the nest, was saved a second time from breaking. To see what would happen if the cuckow was removed, I took out the cuckow, and placed the egg containing the hedge-sparrow in its stead. The old birds, during this time, flew about the spot, showing signs of great anxiety; but when I withdrew, they quickly came to the nest again. On looking into it a quarter of an hour afterward, I found the young one completely hatched, warm and lively. The hedge-sparrows were suffered to remain undisturbed with their new charge for three hours, during which time they paid every attention to it, when the cuckow was again put into the nest. The old sparrows had been so much disturbed by these intrusions, that, for some time, they showed an unwillingness to come to it: however, at length, they came; and, on examining the nest again in a few minutes, I found the young sparrow was tumbled out. It was a second time restored; but again experienced the same fate.—From these experiments, and supposing from the feeble appearance of the cuckow, just disengaged from the shell, that it was utterly incapable of displacing either the egg or the young sparrow, I was induced to believe that the old sparrows were the only agents in this seemingly unnatural business: but I afterwards clearly perceived the cause of this strange phenomenon, by discovering the young cuckow in the

act of displacing his fellow-nestlings." Mr. Jenner remarks, that though nature permits the young cuckow to make this great waste, yet the animals thus destroyed are not thrown away or rendered useless. At the season when this happens, great numbers of tender quadrupeds and reptiles are seeking provision; and if they find the callow nestlings which have fallen victims to the young cuckow, they are furnished with food well adapted to their peculiar state. The bird arrives in Britain about the middle of April, commonly on the 17th, and departs in the first week of July. To this shortness of the period of residence, joined with the numerous progeny which nature has destined it to yield, Mr. Jenner attributes the motive for this singular arrangement in the economy of nature. By means of this resource, cuckow's eggs are laid in an abundance that could not be effected if the bird was to sit herself; and, beside, the egg laid on the last day before she quits the country is left in careful hands, and the young one follows at a future period.

Another species of the Cuculus or Cuckow genus is the Cuckow Indicator or "Honey-guide," which is an inhabitant of Africa, and has an extraordinary faculty of discovering honey, of which it is very fond. The Dutch farmers and Hottentots near the Cape of Good Hope imitate the sound of this bird in the morning before it goes to feed, which brings it to them, and when it moves off for its repast, they follow, as correctly as possible, the direction of its flight, and scarcely ever fail to arrive at some store of wild honey.

CUCUMBER, See the next article.

Cucurbitaceæ, the name of an order in the fragments of Linnæus, consisting of plants which resemble the gourd in external figure, habit, virtues, and sensible qualities. These are divided into two sections. 1. Those with hermaphrodite flowers, as the passion-flower. 2. Those with male and female flowers produced either on the same or distinct roots, as the cucumber, &c. In these the male flowers are generally separate from the female on the same root, and that either in the same angle of the leaves, as in the "sicyos" or serpent cucumber; or in different angles, as in the gourd.

Culex, the gnat: is produced from an aquatic larva, of very singular appearance, which, when first hatched from the egg, measures about the tenth part of an inch. The eggs of the gnat are deposited in groupes of three or four hundred together, are extremely small, and are placed on the surface of the water close to the leaf or stalk of some water plant. It feeds on the minute vegetable and animal particles which it finds on the stagnant water, the head being armed with hooks to seize on aquatic insects, and other kinds of food. When arrived at its full growth, it casts its skin and commences chrysalis. In this state, like the larva from which it proceeded, it is loco-motive, springing about in the water in a similar manner. When ready to give birth to the included gnat, which usually happens in three or four days, it rises to the surface, and the animal quickly emerges from its confinement. Gnats are very troublesome in all countries, but particularly in Lapland, where the air is literally filled with such swarming myriads, that the inhabitants can scarcely venture out of the

smoke of their fires: here however the larva which fill the lakes of Lapland form a delicious and tempting repast to innumerable multitudes of aquatic birds, and thus contribute to the support of the very people which they so dreadfully torment.

Culmination, is the passage of any heavenly body over the meridian, or its greatest altitude for any given day.

Culprit, a formal reply of a proper officer in court, in behalf of the king, after a criminal has pleaded not guilty, affirming him to be guilty. The term is taken from *culpabilis* and *pret*, importing that he is ready to prove the accused guilty.

Culverine, a long slender piece of ordnance, serving to carry a ball to a great distance.

Cup-*galls*, a name given to a curious kind of galls found on the leaves of the oak, and some other trees. They contain the worm of a small fly that passed through all its changes in this habitation, being sometimes found in shape of a worm, sometimes in the nymph and sometimes in the fly-state, in the cavity.

Cupressus, a genus in botany, of which the most beautiful species is the horizontal cyprus, which is the common timber in some parts of the Levant, and is said to resist the worm, the moth, and putrefaction. The doors of St. Peter's at Rome, which lasted eleven hundred years, to the time of Pope Eugenius, were perfectly sound and entire when they were exchanged by that Pontiff for gates of brass. The Athenians used to bury their dead in coffins of cypress, and the mummy chests brought with those bodies out of Egypt are made of their wood.

Curate, an officiating, but unbeneficed, clergyman, who performs the duty of a church, receives a salary from the incumbent of the living, and may be displaced by him or by the bishop. Other curates are perpetual. These are appointed where the tithes are impropriated, or in the hands of laymen, and no vicarage is endowed. This situation is for life, or during good behaviour; and the profits arise either from a fixed stipend or from a certain portion of the tithes.

Curculio, a genus of insects of the Coleoptera order, of which the curculio nucum, or nut-weevil, is the insect produced by the maggot residing in the hazel nut, and is universally known. The female pierces the young nut with its proboscis, and deposits an egg, which is hatched there, and the worm lives on the kernel, till at length the nut falls to the ground, and the insect creeps out of the hole which it has made by gnawing. It burrows under ground, where it lies dormant 7 or 8 months, and then casting its skin commences a chrysalis of the beetle tribe, in due course it casts its skin again and soars an inhabitant of the upper world. Many of the species of foreign and hot climates are large and of extreme beauty, but the most brilliant is the "Imperialis," or diamond beetle, a native of Brazil, which, when seen through a magnifying-glass, affords one of the finest sights imaginable.

Curfew, a signal given in cities taken in war, &c. to the inhabitants to go to bed. Pasquin says, it was so called, as being intended to warn people to secure themselves against the robberies and riots of the night. The most eminent curfew in England was that established by William the Conqueror,

who ordained that, at the ringing of a bell at eight o'clock in the evening, every one, under severe penalties, should extinguish lights and fires, and go to bed: whence, to this day, a bell rung about this time is called a curfew-bell.

CURRENT, a term used to express the present time: thus, 1811 is the current year: the eighth current is the 8th of the present month. The price current is the known and ordinary price. We say "current coin" for the known and common coin of the country.

CURRYING, the business of a *currier*, or the method of preparing leather with oil, tallow, &c. The chief occupation is in softening and suppling ox and calf skins, which make the upper leathers of shoes, coverings of saddles, coaches, and manufactures that are required to keep out water. The currier receives the skins from the tanner.

CUSTOMS, in political economy, the duties, toll, tribute, or tariff, payable to the king upon merchandize exported and imported, and which form a branch of the perpetual taxes. They were denominated, in the barbarous Latin of the ancient English records, "custuma," an appellation which seems to be derived from the French word "coustum" or "coutum," which signifies toll or tribute, not "consuetudines," which is the language of the law, whenever it means customs, usages. Customs, as increasing the prices of commodities in an immoderate degree, creating the offence of smuggling, and requiring great expenditure in their collection, are among the most impolitic and unstatesman-like means of raising a public revenue.

The ancient customs of England have been

usually divided into three branches. 1. The duties on wool and leather: 2. The duty on wine at so much per ton, called tonnage: and 3. The duty upon all other goods at so much in the pound denominated poundage. At this time there are more than 1200 articles subject to the custom duties, and in the year 1806 they produced a net sum of very nearly twelve millions sterling.

Custom-*house*, an office in a maritime city or port-town, for the receipt of customs.

Custos *rotulorum*, an officer who has the custody of the rolls and records of the sessions of peace, and also of the commission of the peace itself. There is one in each county.

Cuticle, a thin membrane closely lying upon the skin or cutis, of which it seems a part, and to which it adheres very firmly.

Cutis is that strong covering which envelopes the whole external surface of animals. The cutis is a peculiar modification of gelatine enabled to resist the action of water; and readily converted into glue.

Cutlery. Though cutlery in the general sense comprises all those articles denominated edge tools, it is more particularly confined to the manufacture of knives, forks, scissars, pen-knives, razors, and swords. Damascus was anciently famed for its razors, sabres, and swords. The latter are said to possess all the advantages of flexibility, elasticity, and hardness. All those articles of cutlery which do not require a fine polish, and are of low price, are made from blistered steel. Those articles which require the edge to possess great tenacity, at the same time that superior hardness is not required, are

made from sheer-steel. The finer kinds of cutlery are made from steel which has been in a state of fusion, and which is termed cast-steel, no other kinds being susceptible of a fine polish. Table knives are mostly made of sheer-steel, the tang and shoulder, or bolster, being of iron, the blade part being attached by giving them a welding heat. The knives after forging are hardened by heating them red hot, and plunging them into water; they are afterwards heated over the fire till they become blue, and then ground. The handles of table-knives are made of ivory, horn, bone, stag-horn, and wood, into which the blades are cemented with resin and pulverized brick. Forks are made almost altogether, by the aid of the stamp and appropriate dies. The prongs only are hardened and tempered. Razors are made of cast steel, the edge of a razor requiring the combined advantages of great hardness and tenacity. After the razor blade is forged, it is hardened by gradually heating it to a bright red heat, and plunging it into cold water. It is tempered by heating it afterwards till a brightened part appears of a straw colour. It would be more equally effected by sand, or what is still better, in hot oil, or fusible mixture consisting of eight parts of bismuth, five of lead, and three of tin. A thermometer being placed in the liquid at the time the razors are immersed for the purpose of indicating the proper temperature, which is about 500 of Fahrenheit. After the razor has been ground into its proper shape, it is finished by glazing and polishing. The glazor is formed of wood, faced with an alloy of lead and tin; after its face is turned to the proper form and size, it is

filled with notches, which are filled up with emery and tallow. This instrument gives to the razor a smooth and uniform surface, and consequently a fine edge. The polisher consists of a piece of circular wood running upon an axis, like that of the stone or the glazor. It is coated with leather, having from time to time its surface covered with crocus martis. The handles of high priced razors are made of ivory and tortoise shell, but in general they are of polished horn, which are preferred on account of their cheapness and durability. The horn is cut into pieces, and placed between two corresponding dies, having a recess of the shape of the handle. By this process the horn admits of considerable extension; if the horn is not previously black, the handles are dyed black by means of a bath of logwood and green vitriol. The clear horn handles are sometimes stained so as to imitate the tortoise-shell: this is effected by laying upon the handle a composition of three parts of potash, one of minium, ten of quick-lime, and as much water as will make the whole into a pulpy mass. Those parts of the handle requiring darker shades, are covered thicker than the other. After this substance is laid upon the handles, they are placed before the fire the time requisite for giving the proper effect.

The manufacture of pen-knives is divided into three departments; the first is the forging of the blades, the spring, and the iron scales; the second, the grinding and polishing of the blades; and the third, the handling, which consists in fitting up all the parts, and finishing the knife. The blades are made of the best cast steel, and hardened and tem-

pered to about the same degree with that of razors. In grinding they are made a little more concave on one side than the other; in other respects they are treated in a similar way to razors. The handles are covered with horn, ivory, and sometimes wood; but the most durable are those of stag-horn. The most general fault in pen-knives is that of being too soft. The temper ought to be not higher than a straw colour, as it seldom happens that a pen-knife is so hard as to snap on the edge.

The beauty and elegance of polished steel is not displayed to more advantage than in the manufacture of the finer kinds of scissars. The steel employed for the more valuable scissars should be cast steel of the choicest qualities; it must possess hardness and uniformity of texture for the sake of assuming a fine polish, great tenacity when hot for the purpose of forming the bow or ring of the scissar, which requires to be extended from a solid piece, having a hole previously punched through it. It ought also to be very tenacious when cold, to allow that delicacy of form observed in those scissars termed ladies' scissars. After the scissars are forged as near to the same size as the eye of the workmen can ascertain, they are paired. The bows and some other parts are filed to their intended form, the blades are also roughly ground, and the two sides properly adjusted to each other after being bound together with wire and hardened up to the bows. They are afterwards heated till they become of a purple colour, which indicates their proper temper. Almost all the remaining part of the work is performed at the grinding mill, with the stone, the lap, the polisher, and the brush.

It is used to polish those parts which have been filed, and which the lap and the polisher cannot touch. Previously to screwing the scissars together for the last time, they are rubbed over with the powder of quick-lime, and afterwards wiped clean with a skin of soft sheep leather. The quick-lime absorbs the moisture from the surface, to which the rusting of steel is justly attributed. Scissars are frequently beautifully ornamented by blueing and gilding, and also with studs of gold or polished steel. The very large scissars are partly of iron and partly of steel, the shanks and bows being of the former. These, as well as those all of steel which are not hardened all over, cannot be polished: an inferior sort of lustre, however, is given to them by means of a burnish of hardened polished steel, which is very easily distinguished from the real polish by the irregularity of the surface. See Rees's New Cyclopedia.

Cutter, a small vessel calculated for swift sailing, furnished with one mast, and rigged as a sloop. They are commonly navigated in the English Channel; and are usually either engaged in contraband trade, or employed by government to take those that are so.

Cutting, or engraving on wood, an art carried to a great pitch two hundred and fifty years ago, and now revived and practised in great perfection. In many subjects, the engraving on wood has a richness which cannot be procured on copper. Of modern books that have been decorated with specimens of this art, the *British birds*, some of the designs in the *Fabliaux*, and Mr. Bulmer's edition of *Somerville's Chase* will, perhaps, afford examples no

where surpassed. Cutting on wood is also practised for many coarser purposes, as in printing calicoes and paper-hangings. The best wood for the blocks is that of box, as being of the finest grain, and the least liable to warp, or be worm-eaten. In this kind of engraving, no part, it must be obvious, can be etched. The other peculiarity is, that in this, that which is to print white is cut away, while, in copper engraving, the white is left untouched. Hence, it may often be observed, that in fine wood-engravings, beautiful lights present themselves, which, there, are among the smallest parts of the artist's merit, while, in copper, the same would be admirable, if not impracticable. Ugo da Carpi, an Italian painter of no very considerable talents, was the inventor of that species of engraving on wood distinguished by the name of *chiaro-oscuro*, in imitation of drawing. This is performed by using more blocks than one; and Carpi commonly had three: the first the outline and dark shadows; the second for the lighter shadows; and the third for the half-tint. In this manner he produced prints after several designs and cartoons of Raphael; particularly one of the Sybil, a descent from the cross; and the history of Simon, the sorcerer. He died in 1500. This art was brought to a great height by Balthazar Peruzzi, of Sienna, and by Permigiano, who published several excellent pieces.

Cycle, in chronology, a certain period or series of numbers, which regularly proceed from the first to the last, and then return again to the first, and so circulate perpetually. See Chronology.

Cyder, a drink made of the juice of apples by

expression. The sweeter apples make the most agreeable cyder. In pursuing the Devonshire method in the requisite process, it is to be observed, 1. That all the promiscuous kinds of apples that have dropped from the trees, from time to time, are to be gathered up and laid in a heap by themselves, and to be made into cyder after having lain so about ten days. 2. Such apples as are gathered from the trees having already acquired some degree of maturity, are likewise to be laid in a heap by themselves, for about a fortnight. 3. The later hard fruits, which are to be left on the trees till the approach of frost is apprehended, are to be laid in a separate heap, where they are to remain a month or six weeks, by which, notwithstanding frost, rain, &c. their juices will receive such maturation as will prepare them for a kindly fermentation, and which they could not attain on the trees by reason of the coldness of the season.

Cylinder, in geometry, a solid body, supposed to be generated by the rotation of a parallelogram. If the generating parallelogram be rectangular, the cylinder it produces will be a right cylinder, that is, it will have its axis perpendicular to its base. If the paralellogram be a rhombus, or rhomboides, the cylinder will be oblique or scalenous.

Cylinder, properties of the, 1. The section of every cylinder by a plain oblique to its base, is an ellipsis. 2. The superfices of a right cylinder is equal to the periphery of the base multiplied into the length of its side. 3. The solidity of a cylinder is equal to the area of its base, multiplied into its altitude. 4. Cylinders of the same base, and standing between the same parallels, are equal. 5. Every cylinder is to

a spheroid inscribed in it, as 3 to 2. 6. If the altitudes of two right cylinders be equal to the diameters of their bases, those cylinders are to one another as the cubes of the diameters of their bases.

Cynics, a sect of ancient philosophers who valued themselves upon their contempt of riches and state, arts and sciences, and every thing, in short, except virtue and morality. This sect was founded by Antisthenes, and is not so much to be regarded as a school of philosophy, as an institution of manners. Its sole object was to subdue the passions, and produce simplicity of manners.

Cynips, the gall fly, a genus of insects of which there are 35 species, chiefly found in the oak. The most beautiful gall is the production of the cynips quercus gemmæ, who piercing the terminal bud of the tree deposits its egg in the interior, and hereby, with the hatching and progressive growth of the larva converts it from a healthy bud into a fine dark green gall, leafed like a rose-bud beginning to blow, about an inch in diameter, and held to the branch by a pedicle.

Cypher, denotes certain secret characters disguised and varied; used in writing letters that contain some secret, not to be understood or discovered but by those between whom the cypher is agreed on. Writing in cypher is chiefly practised in diplomatic correspondence, or in affairs that relate to war, &c. It should possess these three properties: the characters should be easily written and read: they should be very difficult of being found out, and they should be clear of suspicion. See Rees's New Cyclopedia, in

which under the word Cipher, the whole art is exhibited. See DIPLOMATIC *letters*.

CYPRÆA, or cowry, a shell which contains an animal of the slug kind. Cowries are found in the Persian Gulph and Indian Ocean, and some in the Mediterranean, and other seas. In many parts they are used as money in the way of commerce.

CYPRINUS, the carp, a genus of fishes of which the most remarkable species is the gold-fish, known here as an object of curiosity, but a native of China, where it is kept in vases of immense size and exquisite workmanship. It appears sensible of favours, capable of attachment, and is one of the most interesting objects of attention and care to the ladies of that country.

CZAR, a word which, in the Sclavonian language, signifies "king." This was the title by which the sovereigns of Muscovy were known, till, about the year 1772, Peter the Great obtained the consent of the European Powers to style himself and his successors, Emperors of all the Russias. Previously to this, the Czar was sometimes called "his Czarian majesty."

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## D.

D, the fourth letter in the Alphabet, is a kind of middle sound between the *t* and *th*, its sound is formed by a stronger impulse of the tongue to the upper part of the mouth, than is necessary in the pronunciation of the *t*. It is called a lingual letter because the tongue has the principal share in

the pronunciation of it. D. denotes as a numeral, 500, and with a dash over it $\bar{D}$ is 5000: as an abbreviation it stands for Doctor as D. D. doctor of Divinity, &c. D. D. D. are used in dedications for *dat, dicat dedicat*: and D. D. D. D. for *dignum Deo donum dedit*.

Dactyl, a foot in the Latin and Greek poetry, consisting of a long syllable followed by two short ones; as, mūrmŭrĕ.

Dæmon, a name used by the ancients for certain supernatural beings, whose existence they supposed. They were spirits or genii who appeared to men, either to do them service or to hurt them. The platonists distinguish between Gods, demons, and heroes. The dæmons are those since called angels. Christians, by the word dæmon understand only evil spirits or devils. Socrates and Tasso spoke, in very distant ages, of being each attended by a dæmon or familiar. In Tasso, this pretension has been referred to an hypochondriac state of mind; in Socrates, the matter has given rise to much speculation. From the manner, however, in which the philosopher is said to have described his *dæmon*, there seems good reason to believe that he spoke figuratively of his natural *conscience* or *intellect*: "it directed him how to act in every important occasion of life, and restrained him from imprudence of conduct."

Dahomey, a country of Africa, on the slave coast, situated 60 or 70 miles from the Atlantic: the capital is Abomey. All kinds of fruits abound in this fertile country: the inhabitants have two crops a year: their language is Portuguese: their religion

a most miserable superstition, and their government the most perfect despotism upon earth.

Dairo, a high dignity in Japan. This empire is said to be under two sovereigns, an ecclesiastical one called the *Dairo*, and a secular one who bears the title of *Kubo*.

Dairy, a building appropriated to the management of milk, and the manufacture of butter and cheese. Situation and cleanliness are the two grand considerations on this subject: the first should be airy and cool; the second, the most perfect possible. It should be neatly paved, near running water, and its windows should never front the south, south-east, or south-west.

Damask, a silk-stuff, with a raised pattern, so as that the right-side of the damask is that which has the flowers raised or sattined. It has its name from being originally brought from the city of Damascus in Syria.

Damask, a kind of wrought linen, made in Flanders, and obtaining its name from its large patterns in the manner of Damask.

Damask, is a name also given to a very fine steel brought from Damascus, and used for sword-blades and cutlasses. See Cutlery.

Damaskeening, or *damasking*, the art or operation of beautifying iron, steel, &c. by making incisions on those metals, and filling them up with gold and silver wire. This method of ornament is chiefly used for sword blades, guards, and gripes, locks of pistols, &c.

Damps, in natural history, noxious steams and exhalations issuing from the earth. These damps

are chiefly observed in mines and coal-pits: but vapours of the same description will often escape from old lavas of burning mountain; and in those countries where volcanoes are most common, will enter houses, and kill people suddenly. Four kinds of damps are usually reckoned. Of the approach of the first, or "choke-damp," which is the most ordinary, the workmen are warned by the circular shape assumed by the flame of their candle, which lessens gradually till it expires, and by their own difficulty of breathing. Those who escape swooning, seldom suffer any harm from it; but such as swoon away, though not absolutely suffocated, yet experience on their recovery very violent convulsions. The second kind is the *pease-bloom* damp, so called from its smell. The miners in the peak of Derbyshire fancy it arises from the great number of the red trefoil flowers, which they call honey-suckles, that abound in the limestone meadows of the peak. This damp, they say, always comes in the summer-time, but has never been known to be mortal: probably its smell gives timely notice to avoid its effects. The third is the most pestilential, and the most extraordinary of any, if what is said of it be true. Mr. Jessop, who describes this and the former, had his accounts from the miners. Those who pretend to have seen it describe it thus: in the highest parts of the roof of those passages, in a mine which branches out from the main grove, they see, suspended, a round thing, about the bigness of a foot-ball, which, when covered with a film of the thickness and colour of a splinter, or any other accident, the damp immediately flies out and suffocates all the company. The miners

have a way of breaking it at a distance, by means of a stick and long rope; and when they have done this, they purify the place with fire. They assert that it is formed from the steam of the candles and their own bodies, ascends to the highest part of the vault, and there condenses; and that, in time, a film growing over it, it becomes pestilential. The fourth is the fulminating, or fire damp, which being touched with the flame of a candle, takes fire, and explodes with extreme violence.

Damsel, from the French *damoiselle*, a name anciently given to young ladies of noble or genteel extraction. The word, though an extremely elegant one, is now seldom used, except jocularly or in poetry.—*Damoisel*, or *damoiseau*, the masculine of the same word, appears to have been applied to young men of rank; thus we read of *damsel Pepin*, *damsel Louis le gros*, *damsel* Richard, prince of Wales. From the sons of kings, this appellation first passed to those of great lords or barons, afterwards to those of gentlemen, who were not yet knights, and, at present (such is the progress of language), it is never used.

Dance, or *dancing*, as at present practised, may be defined "an agreeable motion of the body, adjusted by art to the measures or tune of instruments;" but, according to what some reckon more agreeable to the true genius of the art, dancing is "the art of expressing the sentiments of the mind, or the passions, by measured steps or bounds that are made in cadence, by regulated motions of the body, and by graceful gestures; all performed to the sound of musical instruments or of the voice." These definitions apply, properly, to two very dif-

ferent practices; the first is the ordinary dance, the second, the ballet-dance: the one an exercise, the other a performance. As an exercise, or amusement, artificial dancing is nothing more than a methodized act instinctive in the human frame. To teach dancing, is to teach the activity of the body to display itself in a manner regulated by principles of grace, or in imitation of steps and gestures which others have used with approbation. Dancing is a most salutary exercise. By its mechanical effects on the body, it inspires the mind with cheerfulness. The music which accompanies it, has effects upon the body as well as upon the mind. It is addressed through the avenue of the ears to the brain, the common centre nf life and motion, whence its oscillations are communicated to every part of the system, imparting to each that equable and uniform vigour and action upon which the healthy state of all the functions depends. By the power of music, many remarkable cures, particularly of those disorders which are much connected with the nervous system, are known to have been performed. Dancing should not be used more than once or twice a week; nor should it even be continued till weariness comes on; nor should the dancer too soon encounter the cold air. If the dance is not performed under cover, motion should not be too suddenly discontinued. Dancing is usually an effect and indication of gaiety; but Palleprat assures us, that there are nations in South America, who dance to express sorrow. It has been in use among every people, civil and savage, though held in esteem among some, and in contempt among others. Many ex-

amples may be adduced, ancient and modern, of its use in religious ceremonies.

Dance, *Country*, is generally considered of English origin, though now transplanted into almost all the countries and courts of Europe; but the name, seeming to imply a rustic way of dancing borrowed from country-people or peasants, is by some others supposed to be a corruption of the French, *contre-danse*, wherein a number of persons placing themselves opposite each other begin a figure. There is no established rule for the composition of tunes to this dance, because there is in music no kind of time whatever which may not be measured by the motions common in dancing.

Dancing, *rope*, or *wire*, walking, leaping, dancing, and performing various other feats, to the sound of music, upon a rope or wire, stretched across a stage at the height of five or six feet from the ground. The actions exhibited in this manner are often astonishing, and show, in connection with others, the extensive and versatile powers of the human frame. Every thing in the art depends upon the equilibrium preserved, and a degree of practice that removes all the obstacles of fear. The feet of the performer are chalked, to remedy the inconveniences of a smooth sole, and he is assisted in the preservation of his balance by a long pole. Suetonius, Seneca, and Pliny, mention elephants that were taught to walk on the rope.

Dane-gelt, a tax laid on every hide of land by the Danes, when they came over into this country, on our ancestors the Saxons, as the terms of peace and departure. It was first imposed as a continual yearly tax upon the whole nation under

king Ethelred. It was levied by William I and II, and finally abolished by king Stephen.

Daniel, book of, in the Old Testament, contains a history of many things done in the Babylonian and Persian empires, as well as a prophecy of things to be done, and many calamities to be executed, with a final deliverance to the chosen people of God. The style of this book is neither so lofty nor figurative as that of the other prophets, it is more like that of an historian than of a prophet. Part of the book was originally written in the Chaldee language, and the rest in Hebrew. The Jews do not reckon Daniel among the prophets, because he lived the life of a courtier rather than that of a prophet, and because his revelations were not in the prophetic manner, but by dream and visions in the night, which they say is the very lowest degree of revelation. Christ, however, to whose authority Christians must ever submit, has decided the question by referring to him as a prophet, (see Matt. xxiv.) "Among the prophets," says the illustrious Newton, "Daniel is most distinct in order of time, and easiest to be understood; and, therefore, in things that relate to the last times, he must be made a key to the rest."

Data, among mathematicians, a term used for such things and quantities as are given or known, in order to find other things therefrom, that are unknown. Euclid uses the word for such spaces, lines, and angles, as are of a given magnitude, or to which we can assign others equal.

Date, in law, is the description of the day, month, or year of our Lord; and year of the reign of the king, in which a deed, or other writing was made.

DATE, the fruit of the *phœnix* or great palm-tree.

DATIVE, in grammar, the third, or one of the oblique cases in the declension of nouns, expressing the state or relation of a thing to whose profit or loss some other thing is referred. It is called *dative*, because usually governed by a verb implying something to be given to a person. In Latin the dative is distinguished by the termination of the word; in English, where there is, strictly speaking, *no* cases, the relation is expressed by the preposition *to* or *for*: thus, *amicus* (the nominative case) "a friend," *amico;* in English "*to* a friend," is the dative, or giving case.

DAUPHIN, the title of eldest sons or heirs apparent of the kings of France, from the time of Philip of Valois, who, in 1343, received the province of Dauphine from Humbert, dauphin of the Viennois, on condition that it should be so borne, to that of Lewis XVI. The dauphin, in his letters-patent, styled himself, "By the grace of God, eldest son of France, and dauphin of Viennois." By the late revolutions the title is entirely done away.

DAY, according to the most natural and obvious sense of the word, that space of time during which it continues to be light, in contradistinction to night, or the space of time which it is dark: but the period of light being somewhat vague and indeterminate, the time between the rising and the setting of the sun is usually spoken of as the day; and the time that elapses between its setting and its rising again, as the night. The day is divided into hours, and a certain number of days make a week, a month, or a year. The old Latin names for the

days of the week are still retained in the journals and proceedings of parliament, and also by physicians: these are dies Solis; dies Lunæ; Martis; Mercurii; Jovis; Veneris, and Saturni. The northerly nations have substituted for the Roman gods and goddesses, such of their own as most nearly resembled them in their peculiar attributes: thus the third day of the week, consecrated by the Romans to Mars, was named from the Scandinavian deity Tyr, in the Danish and Swedish language it is Tyrsdag, whence our Tuesday. Tyr was the god of war, among the nations of the north, as Mars was among the Romans. From Odin, or, as it was pronounced, Wodin, we derive Wednesday. Odin answered, according to Tacitus, to the Mercury of the Romans. Thursday is the day of Thor, the most formidable of the northern nations, answering to the dies Jovis of the ancients. The goddess Freya, from whom we derive our Friday, bears a still greater resemblance to Venus. The astronomical day, as we have already observed in the article Chronology, begins at noon, or when the sun's centre is on the meridian, and is reckoned twenty-four hours to the following noon. The astronomical day or the interval of time between two successive transits of the sun's centre over the meridian, is called likewise a solar day. See CHRONOLOGY.

*Days of grace*, in commerce, a customary number of days allowed for the payment of a bill after it becomes due. Three days of grace are allowed in England; ten in France and at Dantzic; eight at Naples; six at Venice, Amsterdam, Rotterdam, and Antwerp; four at Francfort; five at Leipsic;

twelve at Hamburgh; six in Portugal; fourteen in Spain; and thirty at Genoa. See EXCHANGE.

DEACON, the lowest of the three orders of clergy (deacons, priests, and bishops) in the English church. The word is sometimes used in the New Testament for any one that ministers in the service of God; in which sense, bishops and presbyters are styled deacons: but, in its restrained sense, it is taken for the third order of the clergy, as appears from the concurrent testimony of ancient writers, who constantly stile them ministers of the mysteries of Christ, ministers of episcopacy and the church. In England, the form of ordaining a deacon declares that it is his office to assist in the distribution of the holy communion; in which, agreeably to the practice of the antient church, he is confined to the administration of the wine to the communicants. A deacon is not capable of any ecclesiastical promotion; yet he may be chaplain to a family, curate to a beneficed clergyman, or lecturer to a parish church. He may be ordained in the 23rd year of his age; but it is expressly provided, that no bishop shall ordain the same person a deacon and priest the same day. In Scotland, the deacon's office is only to take care of the poor.

DEAD. See DEATH.

DEAD-*men's-eyes*, in sea-language, a kind of blocks, with many holes in them, but no sheevers, whereby the shrouds are fastened to the chains.

DEAD-*reckoning*, in naval affairs, the judgment or estimation which is made of a place where a ship is, without any observation of the heavenly bodies, and it is performed by keeping an account of her way by the log, in knowing the course which they

have steered by the compass, and by rectifying all the allowances for drift, lee-way, &c. according to a ship's known trim. This reckoning is always to be corrected as often as any good observation can be obtained.

Deafness, the want of the sense of hearing, in a greater or less degree. Deafness generally arises either from an obstruction or depression of the auditory nerve; or from some collection of matter in the cavities of the inner ear; or from the auditory passage being stopped up by hardened excretion; or lastly, from some excrescence, or swelling of the glands, or some foreign body introduced.—Those born deaf are also dumb, as not being able to learn any language, at least in the common way: yet, as the eyes may in some measure serve them for ears, they may understand what is said, by the motion of the lips, tongue, hands, and by the general gesture of the speaker, and even accustom themselves to move their own, as they see others do, and by this means learn to express themselves. Thus Amman, a Swiss physician, residing at Amsterdam, effected surprising things of this kind, and reduced his method to a regular art, of which he published an account in the year 1692. Since that period, the names of Wallis and Braidwood have been known in the same pursuit; and the celebrity of the abbé de l'Epée, in France, is the foundation of baron von Kotzebue's impressive play, known in England by the name of *Deaf and Dumb*. We shall transcribe an extract from a work published by Messrs. Cadell and Davies, as explanatory of the method adopted by M. de l'Epée,

and which comprehends the leading principles of his scheme.

"It is not by the mere pronunciation of words in any language that we are taught their signification: the words *door*, *window*, &c. in our own, might have been repeated to us hundreds of times in vain: we should never have attached an idea to them, had not the objects designated by these names been shown to us at the same time. A sign of the hand or of the eye has been the sole means by which we learned to unite the idea of these objects with the sounds that struck our ear. Whenever we heard these sounds, the same ideas arose in our minds because we recollected the signs made to us when they were pronounced.

"Exactly similar must be our measures with the deaf and dumb. Their tuition commences with teaching them a manual alphabet, such as boys at school make use of to hold conversation at one end of a form with their companions at the other. The various figures of these letters strike forcibly the eyes of deaf and dumb persons, who no more confound them than we confound the various sounds that strike our ears.

"We next write (I say *we*, because in the operations with my deaf and dumb pupils I frequently have assistance) in large characters with a white crayon upon a black table, these two words *the door*, and we shew them the door. They immediately apply their manual alphabet five or six times to each of the letters composing the word *door*, (they spell it with their fingers) and impress on their memory the number of letters and arrange-

ment of them; this done, they efface the word, and taking the crayon themselves, write it down in characters, no matter whether well or ill formed, afterwards they will write as often as you show them the object.

"It will be the same with respect to every thing else pointed out to them, the name being previously written down, which being first on the table in large characters may afterwards be inscribed in characters of ordinary size upon different cards, and these being given to them, they amuse themselves in examining one anothers proficiency, and ridicule those that blunder. Experience has manifested, that a deaf and dumb person possessing any mental powers, will acquire, by this method, upwards of eighty words in less than three days.

"Take some cards, having suitable inscriptions, and deliver them one by one to your pupil, he will carry his hand successively to every part of his body conformably to the name on the card delivered to him. Mix and shuffle the cards; he will make no mistake, or if you choose him to write down any of these names on the table, you will see him in like manner distinguish with his finger every object whose name is so offered him, and thus clearly prove that he comprehends the meaning of every one.

"By this process the pupil will obtain, in very few days, a knowledge of all the words which express the different parts of our frame, from head to foot, as well as of those that express the various objects which surround us; on being properly pointed out to him as you write their names down on the table, or on cards put into his hands.

"We are not, however, even in this early stage, to confine ourselves to this single species of instruction, amusing as it is to our pupils. The very first or second day we guide their hands to make them write down, or we write down for them ourselves, the present tense of the indicative mood to *carry*. Several deaf and dumb pupils being round a table, I place my new scholars on my right hand. I put the forefinger of my left hand on the word *I*, and we explain it by signs in this manner, showing myself with the fore-finger of my right, I give two or three gentle taps on my breast. I then lay my left fore-finger on the word *carry*, and taking up a large quarto volume I carry it under my arm in the skirts of my gown, on my shoulder, on my head and on my back, walking all the while with the mien of a person bearing a load. None of these motions escape his observation.

"I return to the table; and in order to explain the second person, I lay my left fore-finger on the word *thou*, and carrying my right to my pupil's breast, I give him a few gentle taps, making him notice that I look at him and that he is likewise to look at me. I next lay my finger on the word *carriest*, the second person, and having delivered him the quarto volume, I make signs for him to perform what he has just seen me perform: He laughs, takes the volume, and executes his commission extremely well. This method is adapted to the conception of the pupil in his progress through the intricacies of Grammar. The following description of the means of initiating him in a knowledge of the tenses of verbs will convey a sufficient idea

of the plan to general readers: The pupil, though deaf and dumb, had like us an idea of the past, the present, and the future, before he was placed under our tuition, and was at no loss for signs to manifest the difference.

"Did he mean to express a present action? he made a sign prompted by nature, which we all make in the same case without being conscious of it, and which consists in appealing to the eyes of the spectators to witness the presence of our operation; but if the action did not take place in his sight, he laid his two hands flat upon the table, beating upon it gently as we are all apt to do on similar occasions, and these are the signs he learns again in our lessons, by which to indicate the present of a verb.

"Did he design to signify that an action is past? He tossed his hand carelessly two or three times over his shoulder: these signs we adopt to characterize the past tenses of a verb.

"And lastly when it was his intent to announce a future action, he projected his right hand: here again is a sign we give him to represent the future of a verb.

"It is now time to call in art to the assistance of nature.

"Having previously taught him to write out the names of the seven days of the week, one directly under another, we desire him to set them down in that order, and we then put on each side of his writing what follows before and after the same words under different heads.

Present.

To day—Sunday—I arrange nothing.

Imperfect.

Yesterday—Monday—I was arranging my books.

Perfect.

Day before yesterday—Tuesday—I arranged my chamber.

Past Perfect.

Three days ago—Wednesday—I had arranged my closet.

Future.

To-morrow—Thursday—I shall arrange my papers.

Future.

Day after to-morrow—Friday—I shall arrange my drawers.

Future.

Three days hence—Saturday—I shall arrange my cupboards.

"*Yesterday, day before yesterday, three days ago,* are explained by the number of times we have slept since the day of which we speak.

"*To-morrow, day after to-morrow, three days hence,* are explained by the number of times we are to sleep till the day in question arrive.

"We next teach our pupil to lay a restriction upon his motion. To express a thing past he used to throw his arm backwards and forwards towards his shoulder without rule: we tell him he must throw it only once for the imperfect, twice for the perfect, and three times for the past perfect, which in truth is analogous to what it signifies, the past perfect announcing an action longer past than the perfect, and the latter being in the same predicament with regard to the imperfect."

Deal, fir-planks of different thicknesses, brought from the Baltic, and much used in carpentry. Rods of deal expand gradually, or cross the grain, in moist weather, and contract again in dry; and thence have been found to make a useful hygrometer.

Dean, an ecclesiastical dignity in cathedral or collegiate churches, and head of the chapter. As there are two foundations of cathedral churches in England, the old and the new, so there are two ways of creating deans. Those of the old foundation, established before the suppression of monasteries, as the dean of St. Paul's, London; of St. Peter's, York, &c. are raised to that dignity much in the same manner as bishops are raised to theirs, the king first sending his *congé d'elire*, the chapter electing, and the king granting his royal assent; when the bishop confirms the clergyman chosen, and issues his mandate for installation.—Those of the new foundation, whose deaneries were raised upon the ruins of the priories and convents, such as the deans of Canterbury, Durham, Ely, Norwich, Winchester, &c. are donative, and installed by virtue of the king's letters-patent, without either election or confirmation. There are cathedral churches which never had a dean, and in which the bishop is the head of the chapter, and in his absence, the arch-deacon: such are the cathedrals of St. David's and Llandaff. There are also deans without a jurisdiction, as dean of the chapel-royal. In this sense, the word is applied to the chief of certain peculiar churches or chapels.

Dean *and chapter*: the bishop's council to assist him in the affairs of religion, and to assent to every

grant which the bishop shall make to bind his successors.

Death, the cessation of life. The extreme difficulty of defining what state of the animal economy is absolutely indicative of death, has occasioned the repetition of many salutary warnings against too hasty burial. The following are enumerated as the most certain signs or symptoms of death, when taken collectively. 1. Cessation of the pulse. 2. Total suppression of breathing. 3. Loss of animal heat. 4. Rigidity and inflexibility of the body and limbs. 5. Relaxation of the lower jaw. 6. Inability of the eye-balls to return to their sockets, when pressed by the finger. 7. Dimness and sinking of the cornea. 8. Foam in the cavity of the mouth. 9. Blue spots of various sizes, and on different parts of the body. 10. A cadaverous smell. 11. Insensibility to all external stimulants. These symptoms considered individually are far from conclusive, but when all or even the most of them concur at the same time, they afford the most certain criterion of death.

Men, says lord Bacon, fear death, as children fear the dark; and as that natural fear in children is increased by frightful tales, so is the other. Groans, convulsions, weeping friends, and the like, show death terrible; yet there is no passion so weak but conquers the fear of it, and therefore death is not such a terrible enemy; revenge triumphs over death; love slights it; dread of shame prefers it; grief flies to it; and fear anticipates it.

The alarms most prevalent among mankind, seem to arise from two considerations: 1. The sup-

posed corporeal suffering attending it; and II. The state that is to succeed it.

I. With respect to the supposed corporeal suffering, we should observe, 1. That death is a mere passive extinction of the vital fire, unattended with any exertion of the animal functions, and therefore wholly free from pain. The agonies, so much talked of, and the sufferings incident to sickness or wounds, are the agonies and sufferings of life, not of death; they are the struggles of the body to live, not to die; efforts of the machine to overcome the obstacles by which its functions are impeded. 2. It has often been suggested, and always with truth, that by-standers are much deceived by the appearance of pain in those who suffer it. Only a degree commensurate to the strength of the body can ever be endured;—this boundary passed, the victim, in the moment, swoons, and is relieved; or, by the continuance of an endurable pain, the sensibility of the nerves is destroyed. 3. We all suffer much more in parts of our lives than we can at the time of death. Severe torture may be experienced before death; but the period is that which precedes the dying state. 4. Death itself is either an instantaneous stoppage of life, or a gradual, languid, insensible fainting. In the case of drowning, for instance, much is said to be suffered; yet the pain is in the efforts of the body to live, not in its attempts to die, nor in struggles of the soul to separate, as some persons, however strangely, seem to imagine.

II. Of the state that follows death, what is here to be said refers entirely to the body, or rather to a corporeal view of the subject; for it is not to be

supposed that those who think of it with horror, doubt either the immortality of their souls, or the goodness of their Creator. They say that they shudder at the thought of being buried in the earth; they shudder that their bodies should become subject to the laws by which matter is decomposed. These are thoughts on which it is the sickness of thinking to dwell. Life justly revolts from a condition so uncongenial with itself: but is it not absurd to perplex ourselves concerning personal evils that can never arrive while we have the power of feeling them? Death is the end of life. It occupies no part of our existence. It is not an act that we are called upon to do. It cannot be an evil. A happy life is, indeed, desirable; for life *is*; but death *is not*. To talk of death, is to give a name to nothing. To part with life, is to part with that of which we can never regret the loss.

The death of those with whom we are acquainted, rationally afflict us; not that we weep for them, but for ourselves. The affections are wounded. We feel a vacuum in our hearts. Persons sometimes die under circumstances peculiarly lamentable; yet even here, our sorrow is the result of sentiment, rather than of judgment. There may be other causes for regretting the death of our friends; but these are our own, not theirs.

To millions, who have missed, or been pushed out of, the path of enjoyment, death is the most desirable of events; and why is it that in the personifications of this idea, every object is laid hold of to frighten "us poor fools of nature," rather than represent it to us in the figure of a mild and benevolent being, upon whose lap the head of the weary reposes.

Among the finest views that have been given of this, the following by Dr. Franklin, deserves, perhaps, to be ranked :—"We are SPIRITS;—that bodies should be lent us while they can afford us pleasure, assist us in acquiring knowledge, or doing good to our fellow-creatures, is a kind and benevolent act of God; when they become unfit for these purposes, and afford us pain instead of pleasure, instead of an aid, become an incumbrance, and answer none of the intentions for which they are given, it is then equally kind and benevolent that a way is provided by which we may get rid of them: death is that *way*."

DEATH-*watch*, a little insect, famous for a ticking noise, like the beat of a watch, vulgarly and most falsely supposed to be a presage of death. There are two kinds of death-watches. The first is thus spoken of by Mr. Allen, in the Philosophical Transactions: it is a small beetle, 5-16ths of an inch long, of a dark brown-colour, spotted; having transparent wings under the vagina, or hard case belonging to the beetle tribe, a large cap or helmet on its head, and two antennæ proceeding from beneath the eyes, and doing the office of proboscides. The part that it beats with, is the extreme edge of the face, which Mr. Allen calls the upper-lip, the mouth being protracted by this bony part, and lying underneath, out of view.—This account is confirmed by Dr. Derham, with this exception, that instead of ticking with the upper-lip, he observed the insect to draw back its mouth, and beat with its forehead. This author had two of these death-watches, which he kept alive several months; and one of them he could bring to beat whenever he pleased, by imitating its beating. He concludes

from facts and observations which came under his notice that these pulsations are the methods made use of by these creatures to woo one another.

The second kind of death-watch is an insect in appearance quite different from the first: its colour is greyish, and it bears a general resemblance to the louse. The former only beats seven or eight strokes at a time, and quick; the latter will beat some hours together without intermission, and the strokes are more leisurely, and like the beat of a watch. It is very common in all parts of a house in the summer-months; nimble in running to shelter, and shy of being disturbed; yet it beats freely before an observer, and is easily induced to answer a beating, if viewed without causing it molestation. Dr. Derham doubts whether it beats on any other substance, but he never heard their noise except in or near paper. Whether this insect changes its shape and becomes another animal or not, he could not say; but he had reason to suspect that it changes into a sort of fly. The folly and weakness of those who consider the noise of this insect as indicative of approaching death in a family are well displayed by a poet of our own.

——————a wood-worm,
That lies in old wood, like a hare in her form;
With teeth or with claws, it will bite or will scratch,
And chambermaids christen this worm a death-watch:
Because like a watch it always cries click:
Then woe be to those in the house who are sick,
For sure as a gun, they will give up the ghost,
If the maggot cries click, when it scratches the post.

DE BENE ESSE', a Latin phrase used in our law, expressing a doubtful approbation; as to take or do a thing *de bene essé*, is to allow it to be for the

present well done; but when it comes to be more fully examined, then to stand or fall according to the merit of the thing.

Debenture, a term of trade used at the custom-house, for a kind of certificate signed by the officers of the customs, which entitles a merchant exporting goods to the receipt of a bounty or drawback.

Debt, *National*, the engagement entered into by a government to repay at a future period money advanced by individuals for public service, or to pay the lenders an equivalent annuity. The persons who lend the money which government has occasion to borrow generally make a profit of it, but nothing is brought into the country, nor the least addition made to its total wealth by a transaction of this kind; whatever therefore is gained by any individual concerned in it, must be taken from others, and as those who lend the money are persons already in possession of property, and those from whom the sums are requisite for paying the interest, are the public at large, it is evident that all transactions of this nature contribute to encrease the existing disparity of the different classes of the community, and consequently that the natural tendency of the funding system is to destroy the intermediate ranks, and divide a nation into two classes only, as unequal in number, as in circumstances, of very rich, and miserably poor. It may, however, be carried to a very great extent, without fully producing this effect, if counteracting circumstances exist sufficiently powerful to dissipate the gains of the rich nearly as fast as they are acquired, and thus prevent a rapid accumulation of wealth. This has been the case of Great Britain, for the

increase of expences has prevented the wealthy from becoming so enormously rich as they otherwise would have been; still they are possessed of more property and larger incomes than the wealthy members of the community at any former period, and the number of poor is considerably augmented.

The great expences attending the modern system of warfare appears to have created the necessity of national debts, the practice originated in Italy, and was soon adopted in other countries, but it has been brought into a more regular system and carried to a much greater extent in Great Britain than in any other nation. It commenced in the reign of William III. The war which began in 1689 being very expensive, and the grants of parliament not supplying money so fast as it was wanted, the expedient of mortgaging part of the public revenue was adopted. At first the produce of particular taxes was assigned for repayment of the principal and interest of the money borrowed, large sums were also raised on life annuities, and annuities for terms of years, and the fund established for the payment of these debts, being generally inadequate to the charge upon them, occasioned great deficiences which at the conclusion of the war amounted to upward of five millions sterling. In 1697 the debt amounted to nearly 20 millions. In 1716 it amounted to 48 millions, which was mentioned in the king's speech as an insupportable burden, and the government thought it necessary to concert such measures as might lay the foundation of an effectual plan for its reduction. In consequence of this disposition all the existing taxes excepting the *land* and *malt*, were made perpetual, and having been distributed into three classes,

called the aggregate, south-sea, and general funds, the surplusses remaining after satisfying the previous charges upon these respective funds were formed into a sinking fund, for the express purpose of discharging the principal and interest of such debts and incumbrances as had been previously incurred. See SINKING-FUND. The total amount of the national debt at the commencement of the seven years war in 1756 was 75 millions nearly, and at the end of that war it was increased to upwards of 136 millions. By the American war the debt was increased to 252 millions, which, however, in 1792, previously to the war with France, was reduced to 238 millions; from that period to Midsummer 1807 it was increased to the enormous sum of - - - £756,033,231 11s. 5¼d.

| | | | |
|---|---|---|---|
| Redeemed by the commissioners for paying off the National Debt | 117,581,858 | 0 | 0 |
| Total unredeemed debt | £638,451,373 | 11s. | 5¼d. |

The interest and expences of management upon this vast sum amount to more than 22 millions sterling annually, which sum must be raised by taxes independently of those which are called for as the current expences of government. See FUNDS LOANS, &c. &c.

DECA, "ten," begins many words employed in the English language, as

DECAGON, in geometry, a plain figure with ten sides and ten angles.

DECALOGUE, the ten precepts and commandments delivered by God to Moses, engraved on two tables of stone. The Jews, by way of excellence, call these commandments The Ten Words, whence they afterward received the name of *decalogue*. This

people join the first and second into one, and divide the tenth into two.

DECEMBER, in chronology, the last month of the modern year, consisting of thirty one days, and so called as being the tenth month in the Roman year, which began with March.

DECEMVIRI, ten magistrates, elected by the Roman people, and invested with the power of administering the laws of the twelve tables, which were compiled at the time of their creation. The decemviri were introduced by the popular power to counteract the privileges of the patricians; but their misbehaviour caused the same power to procure their abolishment in the third year of their existence.

DECIDUOUS, an epithet chiefly used in Botany. 1. The calyx or cup of a flower is said to be *diciduous* when it falls, or decays, along with the flower-petals, while on the contrary, it is called permanent when it remains after these are fallen. 2. *Deciduous* leaves are those which fall in autumn, in contradistinction to those of ever-greens. 3. *Deciduous* may be applied to the general port of a shrub or tree when its branches *fall*, as those of some kinds do, in a loose, graceful manner.

DECIMAL-*arithmetic*, the art of computing by decimal fractions. Decimal fraction, a fraction the denominator of which is always 1, with one or more cyphers:—Thus, a unit may be imagined to be equally divided into ten parts, and each of these into ten more; so that by a continual decimal subdivision, the unit may be supposed to be divided into 10, 100, 1000, &c. equal parts, called tenth, hundredth, and thousandth parts of a unit.

In decimal fractions, the figures of the numerator are only expressed, the denominator being omitted, because it is known to be always an unit with so many cyphers as there are places, in the numerator. 2. A decimal fraction is distinguished from an integer with a point prefixed, as .2 for $\frac{2}{10}$, .34 for $\frac{34}{100}$, .567 for $\frac{567}{1000}$, &c. The same is observed in mixed numbers, as 678.9 for $678\frac{9}{10}$, 67.89 for $67\frac{89}{100}$, 6.789 for $6\frac{789}{1000}$, &c. Cyphers at the right hand of a decimal fraction alter not its value; for .5 or .50 or .5000 are all equal to $\frac{5}{10}$ths or $\frac{1}{2}$. But cyphers on the left hand in a decimal decrease the value in a tenfold proportion, for .05 is $\frac{5}{100}$ and .005=$\frac{5}{1000}$. As the denominator of a decimal is always one of the numbers 10, 100, 1000, &c. the inconvenience of writing those denominators down may be saved, by placing a proper distinction before the figures of the numerator only, to distinguish them from integers, for the value of each place of figures will be known in decimals, as well as in integers, by their distance from the first or unit's place of integers, having similar names at equal distances as appears by the following scale of places, both in decimals and integers:

&c. 6 6 6 6 6 6 6 · 6 6 6 6 6 6 &c.

millions
hund. of thousands
tens of thousands
thousands
hundreds
tens
units
tenths
hundredths
thousandths
ten thousandths
hund. thousandths
millionths

Decimal fractions are easily reduced into a common denominator, by making, or even supposing, all of them to consist of the same number of places; so .3, .45, .067, .0089, may be written thus .3000, .4500, .0670, .0089: all which consisting of four places, their common denominator is an unit with four cyphers, namely, 10000. Addition and subtraction of decimals are the same as in whole numbers, when the places of the same denomination are set under one another, as in the following examples:

| | | | |
|---|---|---|---|
| To | 35.76 | From - | 18.45 |
| Add | 2.487 | Take - | 864 |
| Sum | 38.247 | Different | 17.586 |

In multiplication the work is the same as in whole numbers; only in the product, separate with a point, so many figures to the right hand as there are fractional places both in the multiplicand and multiplier: then all the figures on the left hand of the point make the whole number, and those on the right a decimal fraction; thus

| | | | |
|---|---|---|---|
| Ex. 1. Mult. | 4.53 | Ex. 2. | .342 |
| by | 4.6 | - | .005 |
| | 2718 | | .001710 |
| | 1812 | | |
| | 20.838 | | |

If there be not so many figures in the product, as ought to be separated by the preceding rule, then, as in example 2, place cyphers at the left to complete the number. In division the work is the

same as in whole numbers; only in the quotient, separate with a point, so many figures to the right hand, for a decimal fraction, as there are fractional places in the dividend, more than in the divisor, because there must be so many fractional places in the divisor and quotient together, as there are in the divisor; thus if the sum be

34.3) 780.615 (32.12

after the divisions, as in whole numbers, I find there are 3 decimal places in the dividend and one in the divisor, therefore by the rule there must be two decimals in the quotient. Vulgar fractions are reduced to decimals of the same value, by dividing the numerator by the denominator thus $\frac{1}{2} = 1 \cdot 0 = .5$, $\frac{3}{4} = 3 \cdot \frac{0}{4}^{0} = .75$ and so on.

DECYPHERING, the art of discovering the purport of a writing, without a previous knowledge of the character or cypher in which the letters of the alphabet are expressed. See CYPHER.

DECK *of a ship*, a planked floor from stem to stern, upon which the guns lie, and the men walk to and fro. Great ships have three decks, first, second, and third, beginning to count from the lowermost.

DECLAMATION, the act of speaking to a public audience with energy and grace. Declamation is a natural act, not an artificial acquisition. It must be produced by natural feeling, be graceful through taste, or the innate sense of congruity, and be excited by real occasion. Art has nothing more to do than to correct bad habits. Criticism points out what is elegant or sublime, and what otherwise.

Declamation, is a term oftea applied to language in a contemptuous sense: the reason is a very strong appeal to the passions may be wholly deficient in basis. It may gain the assent of the feelings without offering a single argument that is worthy of the understanding. Declamation makes assertions without offering proofs; it can even condescend to rest its cause upon prejudices that it despises; it lays hold of every allusion that can inflame, and every word and turn of expression that can seduce its hearer: a poetical effusion, it flies from logical analysis; it assumes the character of truth, and demands belief, not invites examination.

Declaration of *war*, a public proclamation made by a herald at arms to the subjects of a state, declaring them to be at war with some foreign power, and forbidding all and every one to aid or assist the common enemy at their peril.

Declension, in grammar, an inflection of nouns according to their divers cases, as nominative, genitive, dative, &c. In languages, the nouns of which admit of declensions, the peculiar application of a name or word is thus pointed out by its termination; but in the English, and other modern tongues, there are not, properly, any cases or declensions, their absence being supplied by articles: as *a*, *the*, *of*, *to*, &c.

Declination, the distance of any celestial object from the equinoctial, either north or south: or the perpendicular distance of the said object from the equator. See Globes, use of.

Decoction, is a very useful way of extracting the soluble and efficacious part of many drugs, particularly of barks, woods, seeds, roots, &c. The

three decoctions most used in medicine are those of *Bark*, *Sarsaparilla*, and *Barley*.

Decoction of *Bark*. Take of Peruvian bark grossly powdered, one ounce; water one pint and a half. Boil these for ten minutes in a covered vessel, and strain while hot.

Decoction of *Sarsaparilla*. This is likewise called the Decoction of Woods: take of sarsaparilla, cut and bruised, six ounces; sasafras wood, the shavings of guiacum, and liquorice root, of each one ounce; mesereon root, three drachms; water, five pints. These are to be macerated over a slow fire for six hours, and the liquor afterwards to be reduced by boiling to five pints.

Decoction of *Barley*: Take of pearl barley two ounces; distilled water four pints. First wash the barley with cold water, then pour upon the barley about half a pint of water, and boil it a little. This is to be thrown away, and the distilled water is to be added in the boiling state, and to be boiled till the four pints are reduced to about two.

Decomposition, in chemistry, usually signifies the disunion or separation of the constituent parts of bodies.—It differs from mere mechanical division, in that when a body is decomposed, the parts into which it is resolved are essentially different from the body itself; but, though a mechanical force is applied to it ever so long, or with ever so much violence, the minutest particles into which the body may be reduced, still retain their original nature.

Decoy, in naval affairs, a stratagem employed by a ship of war to betray a vessel of inferior force into an incautious pursuit, till she has drawn her

within the range of her cannon, or what is called within *gun-shot*. It is usually performed by painting the stern and sides in such a manner as to disguise the ship, and represent her either much smaller and of inferior force than she really is, or a friend to the hostile vessel which she endeavours to ensnare. Decoying is also performed to elude the chase of a ship of superior force in a dark night; and this is done by committing to the sea a lighted cask of pitch, which will burn for a considerable time, and misguide the enemy. As soon as the cask is lowered, the ship changes her course, and thus escapes with facility, if at any tolerable distance from the foe.

Decoy, among fowlers, a place for catching wild-fowl, generally contrived where there is a large pond surrounded with wood, and beyond that a marshy and uncultivated country. The means of decoy are a number of ducks, trained to the habit of alluring the wild ones of their species to follow them into such inclosures, that, on the appearance of the decoy-man, they drive, through terror, into a purse net, when they are secured. The general season for catching fowls in decoys, is from the latter end of October to February.

Decree, the order of an authoritative power. In England, the sentence of the judges in the civil courts, and in chancery, is called a decree.

Decrepitation, in chemistry, a term applied to the crackling noise of salts exposed to heat, by which they are quickly split. It takes place in those salts that have little water of crystallation, the increased temperature converting that small quantity into vapour, by which the chrystals are sud-

denly burst. Common salt affords a good example of decrepitation, and when used as a flux should be previously decrepitated.

DECRETAL, in the common law, a letter from the pope, determining some point or question in ecclesiastical polity.

DECUPLE *proportion*, that of ten to one.

DEFAMATION, the offence of speaking slanderous words of another; and where any person circulates a report injurious to the credit or character of another, the party injured may bring an action to recover damages proportioned to the injury he has sustained, but he must prove that he has sustained an injury to entitle him to damages; in some cases, however, as for words spoken which by law are in themselves actionable, as calling a tradesman a bankrupt, cheat, &c. there is no occasion to prove any particular damage, but the plaintiff must be particularly attentive to state words precisely as they were spoken, otherwise he will be nonsuited.

DEFINITION, the shewing the meaning of one word by several others which are not synonymous: the special rules for a good definition are these: 1. A definition must be universal, or adequate, that is, it must agree to all the particular species, or individuals that are included under the same idea. 2. It must be proper, and peculiar to the thing defined, and agree to that alone.

These two rules being observed, will always render a definition reciprocal with the thing defined, that is, the definition may be used in the place of the thing defined; or they may be mutually affirmed concerning each other. 3. A definition should be clear and plain; and indeed it is

a general rule concerning the definition both of names and things, that no word should be used in either of them which has any difficulty in it, unless it has been before defined. 4. A definition should be short, so that it must have no tautology in it, nor any words superfluous. 5. Neither the thing defined, nor a mere synonymous name, should make any part of the definition.

Deflagration, the act of burning two or more substances together, as charcoal and nitre. When a quantity of nitre (nitrate of potash) is mixed with an equal weight of sulphur or charcoal, and the mixture is thrown into a crucible heated to redness, a vivid combustion is instantly excited. This is deflagration: which is thus explained, nitre is a compound of nitric acid and potash. The nitric acid consists of nitrogen and oxygen, the oxygen is separated by exposure to the red heat, and being suddenly presented to an inflammable body, a vivid combustion is excited, the affinity of the inflammable body to the oxygen of the nitre will cause a decomposition of the substance at even a lower temperature than a red heat. The nitrogen passes off in the state of gas, and the potash with which the acid was united remains united with the body formed by the combination of the oxygen and the inflammable substance.

Degree, in Geometry, a division of a circle, including a three hundred and sixtieth part of its circumference: every circle is supposed to be divided into three hundred and sixty parts, called degrees, and each degree divided into sixty other parts, called minutes; each of these minutes being again divided into sixty seconds, and each second into

thirds, and each third into fourths, and so on. By this means no more degrees or parts are reckoned in the greatest circle than in the least, and therefore if the same angle at the centre be subtended by two concentrical arches, as many degrees are counted in the one as in the other; for these two arches have the same proportion to their whole peripheries.

DEGREE, in Universities, denotes a quality conferred on the students or members thereof as a testimony of their proficiency in the arts or sciences, and intitling them to certain privileges. The degrees are bachelor, master, and doctor: instead of which last, in some foreign universities, they have licentiates. In each faculty, there are two degrees, bachelor and doctor, which were anciently called bachelor, and master. In the arts likewise there are two degrees which still retain the antient denominations, viz. bachelor, and master.

DEISTS, in the modern sense of the word, are those persons in Christian countries, who, acknowledging all the obligations and duties of natural religion, disbelieve the Christian scheme, or revealed religion. They are so called, in opposition to Christians, from their belief in God alone. The learned Dr. Clarke, taking the denomination in the most extensive signification, distinguishes deists into four sorts. 1. Such as pretend to believe the existence of an eternal, infinite, independent, intelligent Being, and who teach that this supreme Being made the world, though they fancy he does not at all concern himself in the management of it. 2. Those who believe not only the being, but also the providence of God with respect to the natural

world, but who not allowing any difference between moral good and evil, deny that God takes any notice of the morally good or evil actions of men; these things depending, as they imagine, on the arbitrary constitutions of human laws. 3. Those who having right apprehensions concerning the natural attributes of God, and his all-governing providence, and some notion of his moral perfections also; yet, being prejudiced against the notion of the immortality of the human soul, believe that men perish entirely at death, and that one generation shall perpetually succeed another, without any future restoration or renovation of things. 4. Such as believe the existence of a supreme Being, together with his providence in the government of the world, the reality of right and wrong, and the immortality of the soul; but so far only, as these things are discoverable by the light of nature, without any other divine revelation. These last are the only true deists; but as, in his opinion, the principles of these men should lead them to embrace the Christian revelation, the learned author concludes there is now no consistent scheme of deism in the world.

Deity, a term frequently used in a synonymous sense with God. See God.

Delft *ware*, a kind of pottery of baked earth covered with an enamel of white glazing which gives it the appearance and neatness of Porcelain, which see.

Deliquescence, in chemistry, a term applied to certain saline bodies that have become moist or liquid, by means of the water which they absorb from the atmosphere, in consequence of their great

attraction to water. When the salt has, by exposure to air, become so far deliquesced as to be in a liquid state, it is said to be in the state of deliquium. Hence alkali, reduced by this means to a liquid state, was formerly denominated "oil of tartar *per deliquium.*"

DELPHINUS, the dolphin, a genus of fishes, containing several species; among these the porpesse, is the most abundant of the cetaceous animals. Porpesses are gregarious, and are frequently seen frolicking on the water, and playing their uncouth gambols, more especially on the approach of boisterous weather. They feed on smaller fishes, and are themselves very fat, and produce large quantities of oil. They were once considered as a species of luxury at the tables of the great, but are never seen there now. The dolphin is a very large fish, measuring sometimes ten feet in length. It is found both in the Pacific and European seas, and its appearance is in general preliminary to a tempest. It not only pursues and attacks small fish, on which indeed, it subsists, but assails the whale itself, and is stated to have been seen firmly adhering to whales as they have leaped from the water. The ancients appear to have had almost a superstitious attachment to this animal, and relate various anecdotes of it, implying a peculiar susceptibility of gratitude and affection, a strong attachment to mankind, and a rapturous fondness for music.

DELUGE, an inundation covering the earth either in the whole or in part. In history we find accounts of several deluges, as that in the time of Deucalion, which overflowed Thessaly in the year

before Christ 1529. The deluge of Ogyges, which happened 300 years before that of Deucalion. Of a similar kind were those inundations in the Netherlands which, in 1727, overwhelmed and covered with the sea all that part now called the gulf Dollart in the United Netherlands, and in 1421 all that country situated between Brabant and Holland; but the most memorable deluge is that which by way of eminence is called The universal Deluge or Noah's Flood, recorded in Scripture as a general inundation sent by God to punish the corruption and wickedness of the world. This flood makes one of the most considerable epochas in chronology. Its history is given by Moses in the book of Genesis, ch. vi & vii. and its time is fixed to the year from the creation 1656. From this flood, the state of the world is divided into "diluvian" and "anti-diluvian."

DEMAIN, or *demesne* in law, is commonly understood to be the lord's chief manor-place, with the lands thereunto belonging, which he and his ancestors have time out of mind kept in their own manual occupation, for the maintenance of themselves and their families.

DEMAIN denotes also all the parts of any manor not in the hands of freeholders; and is frequently used for a distinction between those lands that the lord of the manor has in his own hands, or in the hands of his lessee demised at a rack-rent; or such other land appertaining to the manor, which belongs to free or copyholders.

DEMAIN is sometimes taken in a more special sense, as opposite to frank-fee; such lands as were in possession of Edward the Confessor, being

called ancient demesne, and all others frank-fee. In England, no private person has any demesnes, according to the simple acceptation of the word, because there is no land but what depends mediately or immediately upon the crown, as of some honour belonging to it, and not granted in fee to an inferior person; wherefore when a person pleading would signify the land to be his own, he says, that he is seized thereof in his demain as of fee; by which it appears, that though his land be to him and his heirs for ever, yet it is not true demesne, but depending upon a superior lord, and is held by rent or service.

DEMESNE. See DEMAIN.

DEMISE, in law, is applied to an estate either in fee, for term of life or years, though most usually the latter. The king's death in law is termed the demise of the king, which does not discontinue any writ or process, nor determine any commission, civil or military, nor a parliament till after six months.

DEMOCRACY, a government, wherein the supreme power is lodged in the hands of the people: such were Rome and Athens of old: as to modern republics, Basil only excepted, their government comes nearer to aristocracy than democracy; and this must always perhaps be the case.

DEMURRAGE, in commerce, an allowance made to the master of a ship by the merchants, for staying in a port longer than the time first appointed for his departure.

DEMURRER, in law, a stop put to any action upon some point of difficulty, which must be determined by the court, before any farther proceedings can be

had in the suit. Demurrers are either general, without showing any particular cause; or special, where the causes of it are particularly assigned; and one may not pray the judgment of the court on an insufficient declaration or plea, otherwise than by demurrer, when the matter comes judicially before them. In pleadings, if a matter is insufficiently alleged, that the court cannot give judgment thereon, a general demurrer will suffice, and so for want of substance in any plea, &c. but if there be any want of form, it is required that there be a special demurrer.

Dendrites, or Arborizations. This appellation is given to figures of vegetables which are frequently observed in fossil substances. They are of two kinds; the one superficial the other internal. The first are chiefly found on the surface of stones, between the strata, and in the fissures of those of a calcareous nature.

Denizen, in law, an alien made a subject by the king's letters-patent, otherwise called donaison, because his legitimation proceeds *ex donatione regis*, from the king's gift. A denizen is enabled in several respects to act as natural subjects do, viz. to purchase and possess lands, and enjoy any office or dignity; yet it is short of naturalization: for a stranger, when naturalized, may inherit lands by descent, which a denizen cannot do. If a denizen purchase lands, his issue that are born afterward may inherit them, but those he had before shall not; and as a denizen may purchase, so he may take lands by devise.

Denominator, in arithmetic, a term used in speaking of fractions. The denominator of a frac-

tion is the number below the line, showing into how many parts the integer is supposed to be divided. Thus, in the fraction $\frac{3}{4}$, the number 4 shows that the integer is divided into four parts. So in the fraction $\frac{a}{b}$, $b$ is the denominator.

Density, *of bodies*, is that property directly opposite to rarity, whereby they contain such a quantity of matter under such a bulk.

A body is said to have double and triple the density of another body, when being equal, the quantity of matter is in one double or triple the quantity of matter in the other. The densities and magnitudes of bodies, are the two great points upon which all mechanics and laws of motion turn.

*Density of the planets.* In homogeneous, unequal, spherical bodies, the gravities on their surfaces are as the diameters, if the densities are equal. But if the bodies be equal, the gravities will be as the densities. Therefore, in bodies of unequal bulks and densities, the gravity will be in a compound-ratio of the diameters and densities. Consequently, the densities will be as the gravities divided by the diameters, and therefore in the several bodies as follows:

| *In the Sun.* | *Herschel.* | *Jupiter.* | *Saturn.* | *Earth.* |
|---|---|---|---|---|
| 1.0000. | 1.3757 | .8601 | .4951 | 3.9393 |

As it is not likely that these bodies are homogeneal, the densities here determined are not to be supposed the true, but rather the mean definities, or such as the bodies would have if they were homogeneal, and of the same mass of matter and magnitude.

Density *of air*, it is found by experiment that the density of the air is the greatest at the earth's

surface, and that it decreases upwards in geometrical proportion, to the altitudes taken in an arithmetical ratio.

Dentifrice, a remedy for the teeth, or a substance used for cleaning them and keeping them in good order: one of the best is said to consist of equal parts of myrrh, charcoal, roach alum and bark, finely pulverized.

Deodand, in English polity, a thing devoted or consecrated to God, for the pacification of his wrath, in case of any misfortune, as a person's coming to a violent end, without the fault of any reasonable creature; as if a horse should strike his keeper, and so kill him. In this case, the horse is to be a deodand; that is, he is to be sold, and the price distributed to the poor, as an expiation of that dreadful event.

Dephlogisticated, a term applied by Dr. Priestley, and others, to what is now called oxygen gas, when he first discovered it. It was denominated by Scheele, who discovered it about the same period, vital air.

Depression, of the sun, or a star, in astronomy, is its distance at any time below the horizon, measured by an arc of a vertical circle.

Depression *of the pole;* When a person sails or travels towards the equator he is said to depress the pole, because as many degrees as he approaches nearer the equator, so many degrees will the pole be nearer the horizons. This phenomenon arises from the spherical figure of the earth. The altitude or depression of any star is measured by an arc of the vertical intercepted between the horizon and that star.

Deprivation, is an ecclesiastical censure, whereby a clergyman is deprived of his living. The causes of deprivation, are open notorious vices: or ignorance; or by having obtained preferment before the proper age or by simoniacal contract.

Dervis, a name given to all Mahometan monks, though of various orders. Many of the dervises travel over the whole Mahometan world, entertaining the people wherever they come, with agreeable relations of all the curiosities they have met with. There are dervises in Egypt, who live with their families, and exercise their trades, of which kind are the dancing dervises at Damascus. They are distinguished among themselves by the different forms and colours of their habits; those of Persia wear blue; the solitaries and wanderers wear only rags of different colours; others carry on their heads a plume, made of the feathers of a cock; and those of Egypt wear an octagonal badge of a greenish white alabaster at their girdles, and a high stiff cap without any thing round it.

Desert, a large extent of country, intirely barren, and producing nothing. In this sense, some are sandy deserts, as those of Lop, Xamo, Arabia, and several others, in Asia; in Africa, those of Lybia and Zaara: others are stony, as the desert of Pharan, in Arabia Petrea. "The Desert," absolutely so called, is that part of Arabia south of the Holy-land, where the children of Israel wandered forty years.

Design, in the manufactories, expresses the figures with which workmen enrich their stuff or silk, and which they copy after some draughtsman, as in diaper, damask, and other flowered silk, tapes-

try, &c. Every piece being composed of several repetitions of the same design, when the whole design is drawn, the drawer, to rebegin the design afresh, has nothing to do but to raise the little strings, with slip knots, to the top, and this he is to repeat as often as is necessary till the whole be manufactured.

Desire, may be considered as an eager longing for some apparent good, centered in particular objects, situations or circumstances:—or as that uneasy sensation excited in the mind by the view or contemplation of any desirable good, which is not in our possession, which we are solicitous to obtain, and of which the attainment appears at least possible.

Despair, is a permanent fear of losing some valuable good, of suffering some dreadful evil, or of remaining in a state of actual misery, without any mixture of hope. It generally succeeds to ineffectual efforts, which have been repeatedly made, and of consequence is excited where no means can be devised equal to the magnitude of the supposed evil.

Detents, in clock-work, are those stops, which, by being lifted up or let down, lock or unlock the clock in striking.

Detonation, in chemistry, an explosion with noise, made by the inflammation of a combustible body. Decrepitation differs from detonation only as producing a fainter noise, or merely a kind of crackling sound peculiar to certain salts. Fulmination is a more quick and lively detonation, such as takes place with certain preparations of gold, silver, mercury, &c.

Deuteronomy, one of the sacred books of the Old Testament, and so called because this last part of the work of Moses, comprehends a recapitulation of the law he had before delivered to the Israelites himself. It is called by the Rabbins the "second law:" also the book of "reprimands," on account of the twenty-eighth chapter, which is full of blessings promised to such as keep the law, and of curses threatened to such as transgress it. This book contains 34 chapters, of which the last could not have been written by Moses; some suppose that Joshua was the author of this chapter, and others maintain that it was written by Ezra, who made some interpolations in the book itself.

Dew, a dense moist vapour, falling on the earth in form of a misling rain, while the sun is below the horizon. See Meteorology.

Dey, in matters of government, the sovereign prince of Algiers, answering to the bey of Tunis. See Beg.

Diadelphia, in the Linnæan system of botany, a class of plants, the seventeenth in order; comprehending all those with papilionaceous and hermaphrodite flowers, and leguminous seed-vessels. The distinguishing characteristic of this class is, that the stamina adhere together; forming two dissimilar bodies or filaments, the one standing above the pistil, and the other surrounding it. This class comprehends pease, beans, vetches, liquorice, and many other genera.

Diadem, in antiquity, a head-band, or fillet, worn by kings, as a badge of royalty. It was made of silk, thread, or wool, tied round the temples and forehead, the ends being tied behind, and let fall on

the neck. It was usually white, and quite plain, though sometimes embroidered with gold, and set with pearls and precious stones. In later times, it came to be twisted round crowns, laurels, &c. and even appears to have been worn on divers parts of the body.

Diagonal, in geometry, a right line drawn across a quadrilateral figure from one angle to another, by some called the diameter of the figure. It is demonstrated in geometry, "1. That every diagonal divides a parallelogram into two equal parts, 2. That two diagonals drawn in any parallelogram, divide the figure into equal parts. 3. That the sum of the squares of the two diagonals of every parallelogram is equal to the sum of the squares of the four sides. 4. In any trapezium, the sum of the squares of the four sides is equal to the sum of the squares of the two diagonals, together with four times the square of the distance between the middle points of the diagonals. 5. In any trapezium, the sum of the squares of the two diagonals is double the sum of the squares of two lines bisecting the two pairs of opposite sides. 6. In a quadrilateral inscribed in a circle, the rectangle of the two diagonals is equal to the sum of the two rectangles under the two pairs of opposite sides.

Dial, or sun-dial, is a plane, upon which lines are described in such a manner, that the shadow of a wire, or of the upper edge of a plate stile, erected perpendicularly on the plane of the dial, may shew the true time of the day. The edge of the plate by which the time of the day is found, is called the stile of the dial, which must be parallel to the earth's axis; and the line on which the said plate is erected,

is called the substile. The angle included between the substile and stile, is called the elevation, or height of the stile.

Those dials whose planes are parallel to the plane of the horizon, are called horizontal dials; and those dials whose planes are perpendicular to the plane of the horizon, are called vertical or erect dials.

Those erect dials, whose planes directly front the north or south, are called direct north or south dials; and all other erect dials are called decliners, because their planes are turned away from the north or south.

Those dials, whose planes are neither parallel nor perpendicular to the plane of their horizon, are called inclining or reclining dials, according as their planes make acute or obtuse angles with the horizon.

The intersection of the plane of the dial, with that of the meridian, passing through the stile, is called the meridian of the dial, or the hour-line of XII.

Those meridians, whose planes pass through the stile, and make angles of 15, 30, 45, 60, 75, and 90 degrees with the meridian of the place (which marks the hour-line of 12,) are called hour-circles; and their intersections with the plane of the dial, are called hour-lines.

In all declining dials, the substile makes an angle with the hour-line of XII; and this angle is called the distance of the substile from the meridian.

The declining plane's difference of longitude, is the angle formed at the intersection of the stile and

plane of the dial, by two meridians; one of which passes through the hour-line of XII, and the other through the substile.

We shall now proceed to explain some of the different principles of their construction.

"The universal principle on which dialling depends."—If the whole earth *a* P *p* (Plate Dial fig. I) were transparent and hollow, like a sphere of glass, and had its equator divided into twenty-four equal parts by so many meridian semicircles, *a*, *b*, *c*, *d*, *e*, *f*, *g*, &c. one of which is the geographical meridian of any given place, as London (which is supposed to be at the point *a*); and if the hours of XII were marked at the equator, both upon that meridian and the opposite one, and all the rest of the hours in order on the rest of the meridians, those meridians would be the hour-circles of London: then, if the sphere had an opake axis, as P E *p*, terminating in the poles P and *p*, the shadow of the axis would fall upon every particular meridian and hour, when the sun came to the plane of the opposite meridian, and would consequently shew the time at London, and at all other places on the meridian of London.

"Horizontal Dial."—If this sphere was cut through the middle by a solid plane A B C D, in the rational horizon of London, one half of the axis E P would be above the plane, and the other half below it; and if straight lines were drawn from the centre of the plane, to those points where its circumference is cut by the hour-circles of the sphere, those lines would be the hour-lines of a horizontal dial for London: for the shadow of the axis would fall upon each particular hour-line of

the dial, when it fell upon the like hour-circle of the sphere.

" Vertical Dials."—If the plane which cuts the sphere be upright, as A F C G (fig. 2), touching the given place (London) at F, and directly facing the meridian of London, it will then become the plane of an erect direct south dial; and if right lines be drawn from its centre E, to those points of its circumference where the hour-circles of the sphere cut it, these will be the hour-lines of a vertical or direct south dial for London, to which the hours are to be set as in the figure (contrary to those on a horizontal dial); and the lower half E *p* of the axis will cast a shadow on the hour of the day in this dial, at the same time that it would fall upon the like hour-circle of the sphere, if the dial-plane was not in the way.

" To construct a Horizontal Dial by the globe." —Elevate the pole to the latitude of your place, and turn the globe until any particular meridian (suppose the first) comes to the north point of the horizon, and the opposite meridian will cut the horizon in the south. Then, set the hour-index to the uppermost XII on its circle; which done, turn the globe westward until fifteen degrees of the equator pass under the brazen meridian, and then the hour-index will be at I (for the sun moves fifteen degrees every hour); and the first meridian will cut the horizon in the number of degrees from the north point that I is distant from XII. Turn on, until fifteen more degrees of the equator pass under the brazen meridian, and the hour-index will be then at II, and the first meridian will cut the horizon in the number of degrees that II is

distant from XII: and so, by making fifteen degrees of the equator pass under the brazen meridian for every hour, the first meridian of the globe will cut the horizon in the distances of all the hours from XII to VI, which is just ninety degrees; and then you need go no farther; for the distances of XI, X, IX, VIII, VII, and VI, in the forenoon, are the same from XII, as the distances of I, II, III, IV, V, and VI, in the afternoon: and these hour-lines continued through the centre, will give the opposite hour-lines on the other half of the dial; but no more of these lines need be drawn, than what answer to the sun's continuance above the horizon of your place on the longest day, which may be easily found.

Thus, to make an horizontal dial for the latitude of London, which is about $51\frac{1}{2}$ degrees north, elevate the north pole of the globe $51\frac{1}{2}$ degrees above the north point of the horizon, and then turn the globe, until the first meridian (which is that of London on the English terrestrial globe) cuts the north point of the horizon, and set the hour-index to XII at noon.

Then, turning the globe westward until the index points successively to I, II, III, IV, V, and VI, in the afternoon; or until 15, 30, 45, 60, 75, and 90 degrees of the equator pass under the brazen meridian, you will find that the first meridian of the globe cuts the horizon in the following numbers of degrees from the north towards the east, viz. $11\frac{2}{3}$, $24\frac{1}{4}$, $38\frac{1}{12}$, $53\frac{1}{2}$, $71\frac{1}{15}$, and 90; which are the respective distances of the above hours from XII upon the plane of the horizon.

To transfer these, and the rest of the hours, to a horizontal plane, draw the parallel right lines *a e* and *b d* (fig. 3) upon that plane, as far from each other as is equal to the intended thickness of the gnomon or stile of the dial, and the space included between them will be the meridian or twelve o'clock line on the dial. Cross this meridian at right angles with the six o'clock line *g h*, and setting one foot of your compasses in the intersection *a*, as a centre, describe the quadrant, *g e*, with any convenient radius or opening of the compasses; then setting one foot in the intersection *b* as a centre, with the same radius describe the quadrant *f h*, and divide each quadrant into ninety equal parts or degrees, as in the figure.

Because the hour-lines are less distant from each other about noon, than in any other part of the dial, it is best to have the centres of these quadrants at a little distance from the centre of the dial-plane, on the side opposite to XII, in order to enlarge the hour-distances thereabout under the same angles on the plane. Thus, the centre of the plane is at C, but the centres of the quadrants at *a* and *b*.

Lay a ruler over the point *b*; and keeping it there for the centre of all the afternoon-hours in the quadrant *f h*, draw the hour-line of I, through $11\frac{2}{3}$ degrees in the quadrant; the hour-line of II, through $24\frac{1}{4}$ degrees; of III, through $38\frac{1}{12}$ degrees; IV through $53\frac{1}{4}$, and V through $71\frac{1}{15}$: and because the sun rises about four in the morning on the longest days at London, continue the hour-lines of IV and V, in the afternoon, through the centre *b* to the opposite side of the dial. This done,

lay the ruler to the centre *a* of the quadrant *e g*, and through the like divisions or degrees of that quadrant, viz. $11\frac{2}{3}$, $24\frac{1}{4}$, $38\frac{1}{12}$, $53\frac{1}{2}$, and $71\frac{1}{15}$ draw the forenoon hour-lines of XI, X, IX, VIII, and VII; and because the sun sets not before eight in the evening on the longest days, continue the hour-lines of VII and VIII in the forenoon, through the centre *a*, to VII and VIII in the afternoon; and all the hour-lines will be finished on this dial; to which the hours may be set, as in the figure.

Lastly, through $51\frac{1}{2}$ degrees of either quadrant, and from its centre, draw the right line *a g* for the hypothenuse or axis of the gnomon *a g i;* and from *g*, let fall the perpendicular *g i*, upon the meridian line *a i*, and there will be a triangle made, whose sides are *a g*, *g i*, and *i a*. If a plate similar to this triangle be made as thick as the distance between the lines *a c* and *b d*, and set upright between them, touching at *a* and *b;* its hypothenuse *a g* will be parallel to the axis of the world, when the dial is truly set, and will cast a shadow on the hour of the day.

The trouble of dividing the two quadrants may be saved, by means of a scale with a line of chords upon it: for if we extend the compasses from 0 to 60 degrees of the line of chords; and with that extent, as a radius, describe the two quadrants upon their respective centres, the above distances may be taken with the compasses upon the line, and set off upon the quadrants.

"To make an erect direct South Dial."—Elevate the pole to the co-latitude of your place, and proceed in all respects as above taught for the horizontal dial, from VI in the morning to VII in the

*Horizontal Dial.*

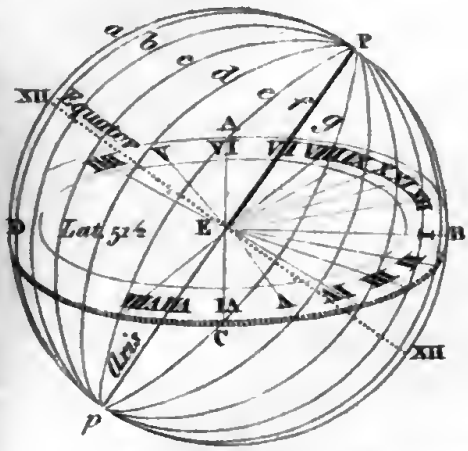



*Fig. 1.*

*Vertical Dial.*

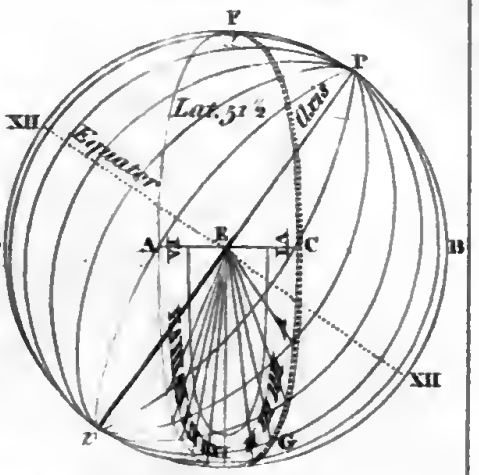



*Fig. 2.*

*Horizontal Dial.*


*Fig. 3.*

*Erect South Dial.*

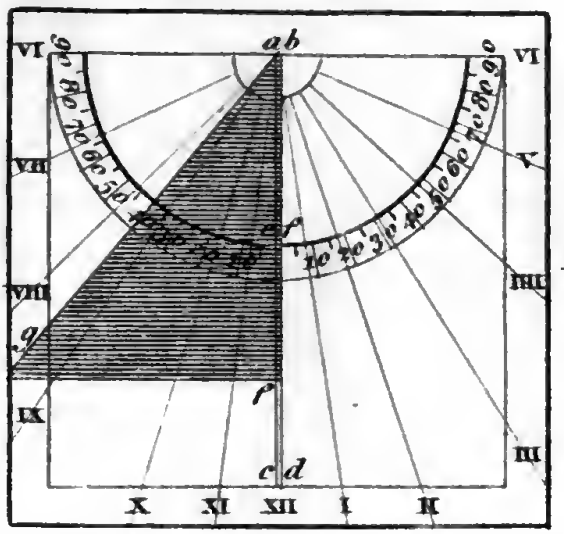



*Fig. 4.*

Cooper sculp.

*Published by J. Harris St. Pauls Ch.d Yd. 1821.*

afternoon ; only the hours must be reversed, as in figure 4, and the hypothenuse *a g*, of the gnomon *a g f*, must make an angle with the dial-plane equal to the colatitude of the place. As the sun can shine no longer on this dial, than from six in the morning until six in the evening, there is no occasion for having any more than 12 hours upon it. See *Ferguson's Mechanics.*

Dial, *Equinoctial*, is that described on an equinoctial plane, or a plane representing that of the equinoctial. Dials of this kind are usually distinguished into upper, which look towards the zenith, and lower, which respect the nadir. Now as the sun only illumines the upper surface of an equinoctial plane, while he is in our hemisphere, or on the northern side of the equator, an upper equinoctial dial will only shew the hour during the spring and summer season. And again, as the sun only illumines the lower surface of an equinoctial plane, while he is in the southern hemisphere, or on the other side of the equator, a lower equinoctial dial will only shew the hour in autumn and winter. To have an equinoctial dial therefore that shall serve all the year round, the upper and lower must be joined together ; that is, it must be drawn on each side of the plane.

Diameter, in geometry, a right line passing through the centre of a circle ; and terminated at each side by the circumference thereof: the chief properties of the diameter are that it divides the circumference of a circle into two equal parts ; hence a method of describing a semi-circle upon any line assuming its middle point for the centre. The diameter is the greatest of chords. See Conic Sections.

DIAMETER, in astronomy. The diameters of the sun and planets are either apparent or real: the apparent diameters are such as they appear to the eye, and being accurately measured by an instrument, are found different in different parts of their orbits. The apparent diameter of the sun is found to vary from 32′ 38″ in January when it is nearest to us; to 31′ 33″ in July when it is farthest from us. The apparent diameter of the moon varies from 29′ 28″ to 33′ 36″: her real diameter is about 2180 miles in length. The apparent diameters of the planets when at their respective mean distances from the earth are as follow:

| | | | |
|---|---|---|---|
| Mercury | 11″ | Jupiter | 39″ |
| Venus | 58″ | Saturn | 18′ |
| Mars | 27″ | Herschel | 3″ 54‴ |

From these apparent diameters and the respective distances from the earth, the real diameters of the sun and planets have been determined in English miles, which are given in the following numbers.

| | Miles. | | Miles. |
|---|---|---|---|
| Mercury | 3224 | Jupiter | 89.170 |
| Venus | 7687 | Saturn | 79.042 |
| Mars | 4189 | Herschel | 35.112 |

The Sun 883.246.

DIAMOND, this is the most valuable and hardest of gems, and though found of different shapes, and sometimes accidentally tinged to several colours; yet it ever carries the same distinguishing characters, and is very evidently in all those states the same body. It is, when pure, perfectly clear and pellucid as the purest water, and is eminently distinguished from all other substances, by its vivid splendor, and the brightness of its reflections. It

is extremely various in shape and size, being found in the greatest quantity very small, and the larger ones extremely seldom met with; the largest diamond ever certainly known to have been found is that in the possession of the Great Mogul, which weighs 279 carats, and is computed to be worth £.779,244.

The diamond has certainly one proper and determinate figure, into which it must naturally concrete, when in a state of rest, and impeded by no other accident in its formation: the true figure is an equilateral octahedron; and wherever it has concreted in a perfect manner, and without any interrupting accidents, it has always formed itself into this figure; and often in this its several surfaces are as bright as if polished by art: but, as in common salt, though its figure be pyramidal, yet very trifling accidents can determine it into cubes and parallelopipeds; so the diamond has often, in the state of formation, been thrown into two other figures, both also seeming regular ones; the one a prismatic columnar one of six angles, somewhat emulating the figure of crystal, the other an oblong quadrilateral column with two truncated ends: these seem the only regular figures of this gem; but besides these it is every day found in numberless other mis-shapen forms, often roundish, emulating the shape of pebbles, but full of small flat planes or faces; frequently oblong, very often flat, and as often tapering, either from one end to the other, or else from the middle to both ends. It is common for diamonds to be too thick or deep for the extent of their surface, and there is a certain proportion of depth, beyond which the gem should not be al-

lowed: in this case two diamonds are often made, by the regularly dividing one: this, when the mass is of an angular figure, is done by cutting it through with a wire, wetted with oil, and covered with diamond-powder; but in the flat or more common masses, it is done much more expeditiously by the grain of the stone, and introducing the point of a fine flat chissel between them. This is not the only use of the splitting, for when a diamond has a flaw, or blemish in it, which greatly debases its value, the plates may be separated at a proper breadth, and the flaw removed; in which case the thinner crest, struck off, is of value in proportion to its size, and the remainder, being now freed from its flaw, is of much more value than it was at first. The places whence diamonds are brought are the island of Borneo, and the kingdoms of Visapour, Golconda, Bengal, in the East Indies; and the Brasils in the West-Indies. They are not unfrequently found yellowish, bluish, and reddish, but more rarely greenish.

In the experiments of modern chemists, the diamond has been reduced to ashes by the power both of the furnace and the burning-glass. In the *Monthly Magazine* for September 1799, an account was given of some interesting experiments by *Guyton*, in Paris, on the combustion of the diamond; whereby it was proved to be a substance similar to charcoal, but containing much more of the pure carbonic principle. This fact has been farther ascertained by the very singular experiment of substituting diamond instead of charcoal, in the conversion of a small portion of malleable iron into steel. For this purpose, a very small

crucible of the purest soft or malleable iron was made out of heads of nails, and fitted with a stopper of the same metal, closely fitting. Into this a small diamond was put, the remaining space around the diamond was filled up with filings of the same iron, and the stopper rammed in very close. The whole was then inclosed in an earthen crucible, this last in a larger of the same material, and the whole closely luted, and exposed for about an hour in a very strong forge furnace. When all was cold, the crucible of iron was found melted down into a button of cast steel. This, when broken, exhibited a perfectly smooth, uniform fracture, and not a vestige of the diamond remained. The steel was exactly similar to that known in England by the name of cast steel. The inference from this curious experiment is, that as diamond will perform the office of charcoal, in converting iron into steel, its nature is the same or very similar to that of charcoal.

Diandria, in the Linnæan system of Botany, a class of plants comprehending all those with hermaphrodite flowers, and only two stamina in each; such are sage, olive, phillyrea, jessamin, rosemary, &c.

Diapason, in music, a musical interval, by which most authors, who have wrote upon the theory of music, use to express the octave of the Greeks. The diapason is the first and most perfect of the concords; if considered simply, it is but one harmonical interval; though, if considered diatonically, by tones and semitones, it contains seven degrees, viz. the three greater tones, two lesser tones, and two greater semitones. The interval of a diapason,

that is, the proportion of its grave sounds to its acute, is duplicate, *i. e.* as 2 : 1.

DIAPASON, among the musical instrument makers, a kind of rule or scale, whereby they adjust the pipes of their organs, and cut the holes in their flutes, hautboys, &c. in due proportion, for performing the tones, semitones, and concords just.

DIAPHRAGM, in anatomy, a large musculous membrane or skin placed transversely in the trunk, and dividing the thorax from the abdomen.

DIARY, a table of days: See ALMANACK. The subjoined table, showing the days of the week that begin the several months for ever, is, to that effect, a *perpetual diary*:

| *Month.* | *A* | *B* | *C* | *D* | *E* | *F* | *G* |
|---|---|---|---|---|---|---|---|
| JANUARY ... | Sun. | Sat. | Frid. | Thu. | Wed | Tue. | Mon |
| FEBRUARY | Wed | Tue. | Mon | Sun. | Sat. | Frid. | Thu. |
| MARCH ..... | Wed | Tue. | Mon | Sun. | Sat. | Frid. | Thu. |
| APRIL..... | Sat. | Frid. | Thu. | Wed | Tue. | Mon | Sun. |
| MAY ..... | Mon | Sun. | Sat. | Frid. | Thu. | Wed | Tue. |
| JUNE ..... | Thu. | Wed | Tue. | Mon | Sun. | Sat. | Frid. |
| JULY ..... | Sat. | Frid. | Thu. | Wed | Tue. | Mon | Sun. |
| AUGUST..... | Tue. | Mon | Sun. | Sat. | Frid. | Thu. | Wed |
| SEPTEMBER | Frid. | Thu. | Wed | Tue. | Mon | Sun. | Sat. |
| OCTOBER ... | Sun. | Sat. | Frid. | Thu. | Wed | Tue. | Mon |
| NOVEMBER | Wed | Tue. | Mon | Sun. | Sat. | Frid. | Thu. |
| DECEMBER | Frid. | Thu. | Wed | Tue. | Mon | Sun. | Sat. |

This table is very plain; for having the dominical letter for the given year, find that on the head, and guide your eye down from it till you come opposite the month, and there is the name of the day of the week that begins that month. See DOMINICAL Letter.

DIASTOLE, signifies the dilatation of the heart, auricles, and arteries, and stands opposed to the systole, or contraction of the same parts.

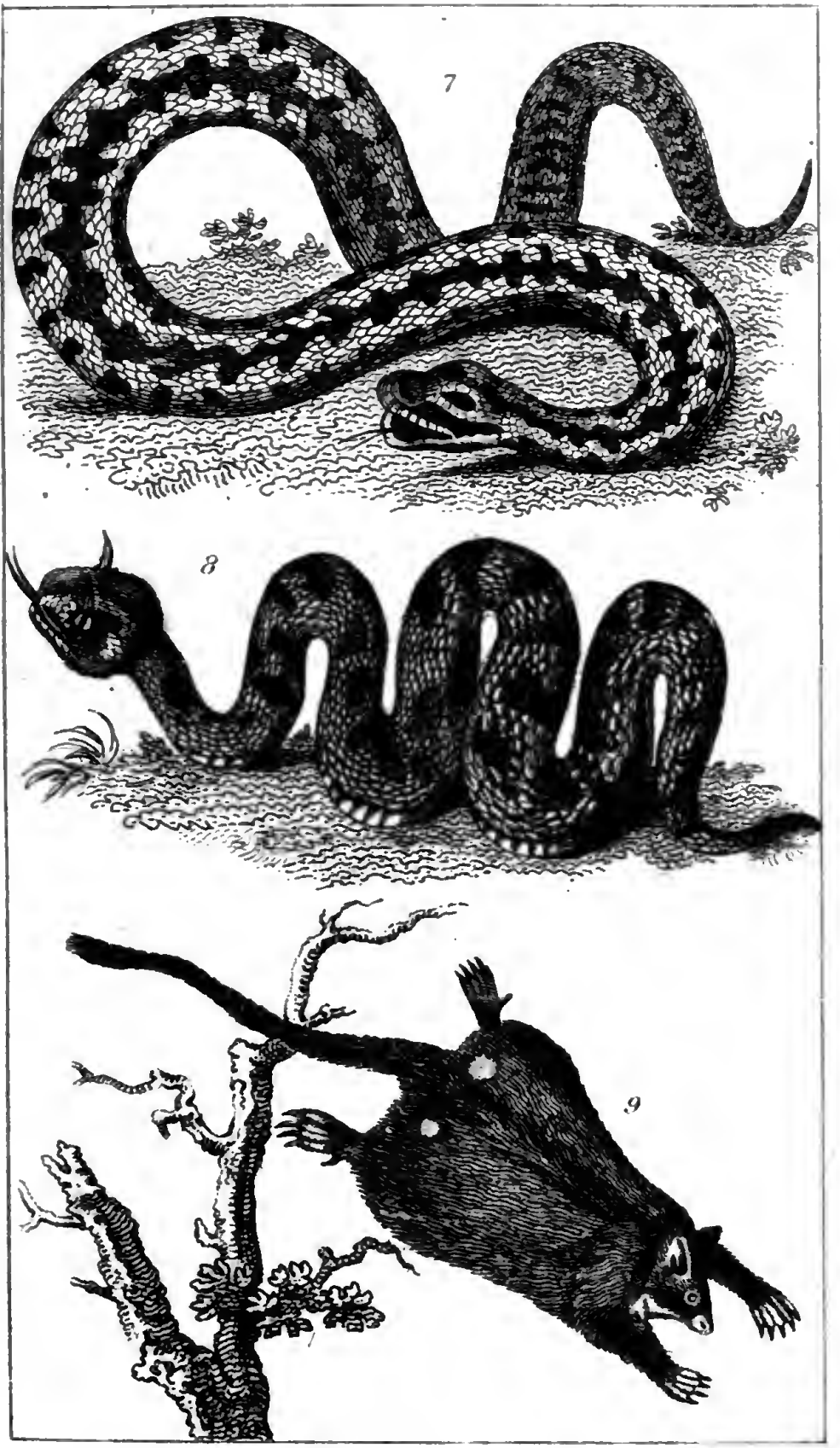
DIATESSARON, a concord or harmonical interval composed of a greater tone, a less tone, and one greater semitone: its proportion in numbers is 4: 3. The word diatessaron has of late years been applied by authors for a harmony of the four gospels.

DICE, certain cubical pieces of bone or ivory marked with dots on each of the faces, from one to six, according to the number of faces. There are divers ways of making dice to suit the purposes of gamblers and villains: as by sticking a hog's bristle in them, so as to make them run high or low:—or by drilling and loading them with quicksilver, which cheat may be discovered by endeavouring to balance them by their diagonal corners, for if they are false, the heavy sides will, under such circumstances, always turn down. Dice are said to be of great antiquity, and to have been invented by Palamedes at the siege of Troy, for the amusement of the officers and soldiers. Dice like cards pay a very heavy duty to government, and cannot legally be imported.

DICTATOR, in the policy of the ancient Romans, a magistrate invested with sovereign and even arbitrary power. He had the power of life and death;

also to raise or disband troops, make war or peace, and that without the consent either of the senate or people, or being accountable for his proceedings. He was elected by one of the consuls in the night-time on the frontiers of the common-wealth, and no where else; and the ordinary duration of his office was only for six months, during which time all other magistracies ceased, the tribuneship excepted. Whenever he appeared in public, he was attended by twenty-four lictors, or double the number allowed a consul. However, notwithstanding all this power, he could not go out of Italy, or even ride on horse-back during a march, without leave from the people. This was accounted the safe-guard of the common wealth for four hundred years together, till Sylla and Cæsar, by assuming the title of perpetual dictators, converted it into tyranny, and rendered the very name odious.

Didelphis or Opossum, in natural history, is noticed for the singularity of its structure, which consists in the female's possession of a bag or pouch in the lower part of the abdomen, which is opened and closed at pleasure, and to which her young resort for shelter and security in a variety of dangers. The Virginian opossum is gentle and inoffensive. The female produces four or five at a birth, and prepares a sort of nest for herself of grass, near the root of a tree. She has the power of closing her pouch so completely as to render it a matter of difficulty to open it. See Plate Nat. Hist. fig. 9. The great flying opossum of New-Holland is nearly two feet in length to the beginning of its tail, which is likewise about two




Cooper sculp.

*Fig. 7.* **Coluber** *Berus: Common Viper.*
*Fig. 8.* **Coluber** *Cerastes.*
*Fig. 9.* **Didelphis** *volans: Flying Opossum.*

*Published by J Harris St Pauls Ch.d Yd 1824*

feet long. By an expansile membrane reaching on each side of its body, from the fore to the hind legs, it is enabled to leap to an extraordinary distance, and has thus gained its name. Its fur is of the most exquisite fineness, and for the greatest part of a sable, or deep grey, brown colour, extremely brilliant.

Didus, or dodo, is a genus of birds of the order Gallinæ, containing three species, of which the Didus ineptus may be noticed, it is called the hooded dodo, is a very large bird, and does, or at least did, inhabit the islands of Bourbon and Mauritius. Its pace is very slow, and some individuals are said to weigh 150lbs. each. Its head appears to be covered with a black cowl, and altogether its figure is singularly curious and grotesque. See Plate Nat. Hist. fig. 10.

Didynamia, in the Linnæan system of botany, a very comprehensive class of plants, the fourteenth in order; the essential characteristic of which is, that there are four subulated stamina, inserted into the tube of the flower, two whereof are shorter than the others, and placed together; the antheræ being commonly hid under the upper lip of the flower, and connivent in pairs. To this genus belong baum, germander, lavender, thyme, betony, mint, basil, fox-glove, bear's-breech, &c.

Diet, or Dyet, in matters of policy, is used for the general assembly of the states, or circles of the empire of Germany, and formerly of Poland, to deliberate and concert measures proper to be taken for the good of the public. The general diet of the empire was usually held at Ratisbon: it consists of the emperor, the nine electors, and the ecclesias-

tical princes, viz. the archbishop, bishops, abbots, and abbesses; the secular princes, who are dukes, marquises, counts, viscounts, or barons; and the representatives of the imperial cities. It meets on the emperor's summons, and any of the princes may send their deputies thither in their stead. The diet makes laws, raises taxes, determines differences between the several princes and states, and can relieve the subjects from the oppressions of their sovereigns.

The diet of Poland, or the assembly of the states, consisted of the senate and deputies, or representatives of every palatinate or country and city, and met usually every two years, and oftener, upon extraordinary occasions, if summoned by the king, or in his absence, by the archbishop of Gnesna. The general diet of Poland sat but six weeks, and often broke up in a tumult much sooner: for one dissenting voice prevented their passing any laws, or coming to any resolutions on what was proposed to them from the throne. Switzerland had also a general diet, usually held every year at Baden, and represented the whole Helvetic body: it seldom lasted longer than a month. Besides this general diet, there were diets of the Protestant cantons, and diets of the Catholic ones; the first assembled at Araw, and were convoked by the canton of Zurich; the second at Lucern, convoked by the canton of that name.

Dietetics, the science or philosophy of diets; or that which teaches us to adapt particular foods to particular organs of digestion, or to particular states of the same organ, so that the greatest possible portion of nutriment may be extracted from a given

quantity of nutritive matter; or a sufficient portion may be obtained with the least possible quantity of organic action and exhaustion. In this sense the science of dietetics embraces a knowledge as well of the organs and economy of digestion, as of the substances to be digested. The common experience of mankind will sufficiently acquaint any one with the sorts of food which are wholesome to the generality of men, and his own experience will teach him which of these agrees best with his particular constitution. Scarcely any other directions besides these are wanted, except the knowledge that as variety of food at the same meal, and poignant sauces, will tempt most persons to eat more than they can well digest, they ought, therefore, to be avoided by all of weakly habits of body, and by those who are desirous of preserving their health. See DIGESTION.

DIEU *et mon droit*, i. e. *God and my right*, the motto of the royal arms of England, first assumed by king Richard I. to intimate that he did not hold his empire in vassalage of any mortal. It was afterward taken up by Edward the Third, and was continued, without interruption, to the time of the late king William, who used the motto *je maintiendray*, though the former was still retained upon the great seal. After him queen Anne used the motto *semper eadem*, which had been before used by queen Elizabeth; but ever since queen Anne, *Dieu et mon droit* has continued to be the royal motto.

DIGEST, in law literature, a collection of the decisions of the Roman lawyers properly digested, or arranged under distinct heads, by order of the em-

peror Justinian. It constitutes the first part or volume of the civil law.

Digestion: an important distinction exists between animals and vegetables, in the mode in which they receive their nourishment. Vegetables are perpetually absorbing matter from the soil, which immediately passes into the sap-vessels, and is soon changed by respiration and secretion. Animals, on the contrary, with few exceptions, take in food at intervals, and retain it in their stomach for a considerable time, where it undergoes a chemical change, which constitutes the function of digestion, the first step in the general process by which animal matter is formed. See Physiology.

Digit, in astronomy, the twelfth part of the diameter of the sun or moon, is used to express the quantity and magnitude of an eclipse. Thus, an eclipse is said to be of six digits, when six of these parts are obscured. Digit is also a measure taken from the breadth of the finger: it is equal to three-fourths of an inch. Digits, in arithmetic, signify any integer under 10, as 1, 2, 3, 4, 5, 6, 7, 8, 9.

Digynia, the name of an order, or secondary division in each of the first thirteen classes, except the ninth in Linnæus's system, consisting of plants, which to the classic character, add the circumstance of having two styles or female organs.

Dilapidation, is where an incumbent of a church living suffers the parsonage or out-houses to fall down, or to be in decay for want of necessary reparation; or it is the pulling down or destroying any of the houses or buildings belonging to a spiritual living, or destroying of the woods, trees, &c.

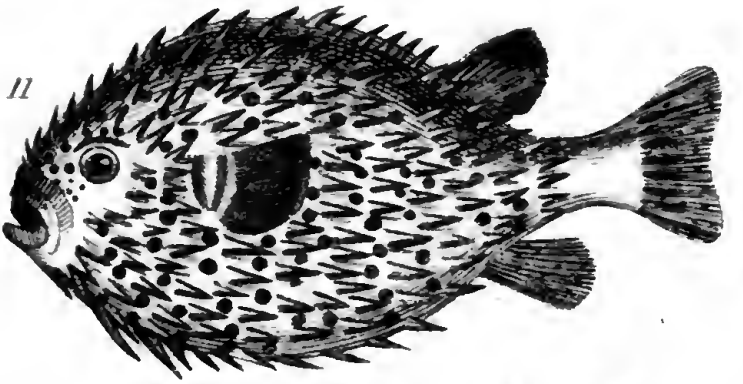
appertaining to the same; for it is to extend to committing or suffering any wilful waste in or upon the inheritance of the church.

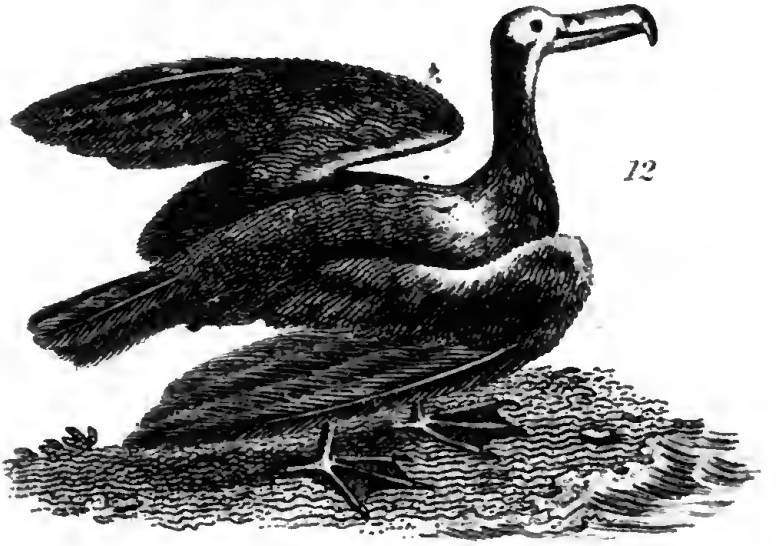
Diocese, denotes a particular district, or division, under the direction and government of a bishop. It is the general opinion, that the Christian church in the modelling her own external polity, followed the state and division of the Roman empire, and that the ecclesiastical magistracy was originally formed upon the plan of the civil. As the empire therefore was divided into provinces and dioceses, (a diocese, according to Constantine's distribution, comprehended several provinces under the direction of a general magistrate) so the church set up her metropolitical and patriarchal power, the metropolitan bishops answering to the civil magistrates of provinces, and the patriarchs to the civil magistrates of dioceses. This is to be understood of the state of the church after the empire became Christian. Some pretend that a diocese, during the three first centuries, was never more than such a number of people as could meet, and ordinarily did meet, in a single congregation: others extend the limits of the ancient dioceses, so as to include a whole city, and the region about it. And this is the plain reason of that great difference we find in the extent of ancient dioceses, some being very large, others very small, according as each city happened to have a larger or lesser territory under its jurisdiction. Dioceses were originally called parishes, by which name is to be understood the episcopal city, with the country places and villages round it. The name diocese began first to be used in the fourth century, when the exterior po-

lity of the church began to be formed upon the model of the Roman empire. England, in regard to its ecclesiastical state, is divided into two provinces, viz. Canterbury and York, and each province into subordinate dioceses, of which there are twenty-two in England, and four in Wales.

Diodon, a genus of fishes consisting of three species, of which the diodon hystrix, or sea porcupine, claims notice. It inhabits the Indian and American seas, and is about two feet in length. It possesses the faculty of raising and depressing its spines at pleasure, and likewise of flattening its body, or changing it to a globular form, and is often fished for with a rod and line, merely for the sake of the curious spectacle which it exhibits by these violent alternations. On its first feeling the hook, it appears agitated beyond measure. Its spines are erected, and its body swelled into the form of a ball, and thus for a considerable time it moves rapidly in various directions, as if surprized and maddened by the failure of all its efforts at revenge and extrication. Being at length exhausted, its spines are levelled, and it assumes a flat form. As it is drawn near the shore, it exhibits again all its fierceness, in which state it is thrown upon the land, and there suffered for some time to remain till death extinguish its resentments and vitality. See Pl. Nat. Hist. Fig. 11.

Dioecia, in the Linnæan system of botany, the twenty-second class of plants. To this belong the willow, hemp, poplar, juniper, pistacchia, yew, &c. in all which, the female plants alone produce seeds; but even those prove barren, unless planted near


Cooper sculp.

*Fig. 10.* Didus *ineptus*: Hooded Dodo.
*Fig. 11.* Diodon *hystrix*: Porcupine Diodon.
*Fig. 12.* Diomedea *exulans*: wandering Albatross.

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the male plants, so as to be within the reach of the farina fœcundans.

Diomedia, the albatross, in natural history, a genus of birds of the order anseres, of which there are many species. The diomedia exulans, or wandering albatross, is found in many parts of the world, but is very abundant at the Cape of Good Hope. Its length is sometimes four feet, and its extent, from wing to wing, ten. Its sounds are harsh, and thought to resemble the braying of an ass. Its arrival at Kamtschatka is regarded as an infallible presage of the speedy arrival of vast shoals of fish; upon these, however emaciated when it arrives, it fattens within a very short time. It quits Kamtschatka in August, and retires to Patagonia and the Falkland islands, where it builds its nest with earth, on the ground, a foot in height, and of a circular figure. While the female sits, the male is incessant in his assiduities to provide for her subsistence, and both are so tame as to permit any person to push them from their nest, and deprive them of their eggs, without the slightest resistance. See Pl. Nat. Hist. Fig. 12.

Dioptrics, the science of refractive vision, or that part of optics which considers the different refractions of light in passing through different media, as air, water, glass, &c. See Optics.

Diploma, an instrument or licence given by colleges, societies, &c. to a clergyman to exercise the ministerial function, or to a physician to practise the profession, &c. after passing examination, or admitting him to a degree.

Diplomatic *letters*. This is the art of reading letters written in cypher, and is founded on a know-

ledge of the art of writing according to this method of concealment. In examining a piece in newly invented characters we should endeavour to ascertain, whether the number of characters correspond, or nearly so, with the ordinary number of alphabetical letters. We must observe which of the characters, whether taken singly or combined, occur oftenest in the whole specimen; and of these probably the most frequent will represent *e*, *a*, *i*, *o*; *e* being much more common than the rest of the vowels, but *u* & *y* are even less frequent than many of the consonants. Endeavour next to ascertain the beginning and ending of words which are sometimes distinguished by spaces or points, or the insignificant marks interposed; but however it be done, you must expect these signs to occur after every few letters, and the frequency of their occurrence may serve as some guide. When you have found out the distinction between words, take particular notice of the order, number, frequency, and combination of the letters in each word, and first examine the characters of which the shortest monosyllables are composed. Remember (1.) That no word can be without a vowel, a word of one letter must, therefore, be a vowel, or a consonant with an apostrophe: (2.) That the vowels are more frequently doubled at the beginning of words than the consonants: indeed the latter are only doubled at the beginning of Spanish and Welsh words: (3) That the vowels mostly exceed the consonants in short words; and when the double consonants are preceded by a single letter, that this letter is a vowel. (4.) That the single consonant which precedes or follows double consonants is *l*, *m*, *n*, or

r; (5) That the letter *q* is always followed by *u*, and when two different characters occur the latter of which is often joined with other letters, but the former never found alone, nor joined with any than the latter, those characters stand for *qu*, which two, excepting a few Scottish names are always followed by a vowel: 6. That although every language has something peculiar in its structure, the foregoing observations will apply with little variation to all the European languages.

In the English, *and*, and *the*, are more often found than any other words, *h* is frequently preceded by *w*, *c*, *s*, and *t*: *y* is seldom used in the middle of a word; the double letters *ll*, *ss*, appear frequently at the end of words; *ed*, *ty*, *ly*, *ing*, and *tion*, are very common terminations; *em*, *in*, *com*, and *con* are frequent prepositions: *a*, *i*, *o*, may stand alone: *o* is often followed with *u*; *e* is much more frequent in the beginning of words than the middle; and in the English the *e* is perpetually employed, as in *yes*, *yet*, *her*, *never*, *me*, *we*, *he*, *the*, *she*, *they*, *ye*, *fee*, *see*, *be*, *ever*, *speed*, *need*, *deference*, *excel*, *excess*, *&c.* When you meet with a character doubled in the middle of a word of four letters, it will be necessary to consider what words of four letters are so spelled. It is probable the vowels *o* or *e* are these; as *meet*, *feel*, *good*, *book*, *look*, &c. In polysyllables, where a double character occurs in the middle of a word, it is for the most part a consonant, and if so, the preceding letter is always a vowel. See NICHOLSON'S BRITISH CYCLOPEDIA.

DIPLOMATICS, a word signifying the king's letters patent for the immediate expediting of an ambassador or envoy to a foreign court. The principal

aim of the "corps diplomatic" is to discover the movements and intention of their brethren, and to conceal their own: to accomplish this, artifice, bribery, deceit, and prevarication, are more frequently necessary than open and manly conduct.

Dipping, among miners, signifies the interruption, or breaking off of the veins of ore, an accident often attended with much trouble, before the ore can again be discovered.

Dipsacus, in botany, contains four species, of which the dipsacus fullonum, or cultivated teasel, is reared in great quantities, in the West of England, for raising the nap upon woollen cloths, by means of crooked awns upon the heads. For this purpose they are fixed on the circumference of a large broad wheel, which turns round while the cloth is held against them.

Diptera, an order of insects in the Linnæan system, which contains such insects as are furnished with two wings only; such as gnats, flies, and a variety of other insects. Under each wing is a clavate balancer or poiser with its appropriate scale.

Dipthong, in grammar, a double vowel, or the mixture of two vowels pronounced together, so as to make one syllable. See the article *Vowel*. The Latins pronounced the two vowels in their dipthongs, *ae* or *æ*, *oe* or *œ*, much as we do, only that the one was heard much weaker than the other, though the division was made with all the delicacy imaginable. Dipthongs, with regard to the eyes, are distinguished from those with regard to the ears: in the former, either the particular sound of each voice is heard in the pronunciation, or the sound of one of them is drowned; or, lastly, a new

sound, different from either, results from both: the first of these only are real dipthongs, as being such both to the eye and the ear. Dipthongs with regard to the ear are either formed of two vowels, meeting in the same syllable, or vowels whose sounds are severally heard; or of three vowels in the same syllable, which only afford two sounds in the pronunciation. English dipthongs, with regard to the eye and ear, are *ai*, *au*, *ea*, *ee*, *oi*, *oo*, *ou*. Improper English dipthongs with regard to the eye only, are *aa*, *ea*, *ou*, *eu*, *ie*, *ei*, *ou*, *oe*, *ue*, *ui*.

Dipus, the jerboa, a genus of Mammalia in natural history, containing four species. The Dipus sagitta, or Egyptian jerboa, is about the size of a rat, and was known to the ancients by the name of the two-footed mouse. It is found in various parts of Africa, and in the eastern provinces of Siberia. In its posture and motions it resembles a bird. It inhabits subterranean apartments, in which it reposes during the day, choosing the night for its excursions and for obtaining its food. In Egypt jerboas are used as food: are extremely fond of basking in the sun when tame, and are often very playful and alert.—See Pl. Nat. Hist. fig. 13.

Direction, in mechanics, signifies the path or line of a body's motion, along which it endeavours to proceed according to the force impressed.

Director, in commercial polity, a person who has the management of the affairs of a trading company: thus we say the Directors of the India-Company, South-Sea-Company, &c. See Company. The directors are considerable proprietors in the stocks of their respective Companies, being chosen by plurality of votes from among the body

of proprietors. The Dutch East-India Company have sixty such directors; that of France twenty-one; the British East-India-Company has twenty-four, including the chair-man, who may be re-elected for four years successively. These last have salaries of 150*l.* a year each, and the chairman 200*l.* They meet at least once a week, and commonly oftener, being summoned as occasion requires. But besides these directors, who reside in Europe, and there superintend the general economy of the trading companies, there are also officers belonging to them in Asia, Africa, and America, under the title of director-general, and, by an honourable abbreviation, generals. The English gave these the title of Presidents, whereof there used to be two in the East-Indies, one at Surat, and the other at Bantam. They have the absolute disposal of all the Company's effects, regulate their trade, establish new compting-houses, and command all the merchants, and even captains of ships; make presents to princes, treat with them, &c. It is true, they have a council, but one entirely subservient to their pleasure.

Director, in surgery, a grooved probe to direct the edge of the knife or scissars in opening sinusses or fistulæ, &c. that by this means the subjacent nerve, and tendons may remain unhurt.

Disability, an incapacity in a man to inherit or take a benefit which otherwise he might have done, which may happen by the act of any ancestor: by the act of the party himself: by the act of the law, and by the act of God.

Disc, *discus*, in antiquity, a quoit made of stone, iron, or copper, five or six fingers broad, and more

than a foot long, inclining to an oval figure, which was hurled in the manner of a bowl, to a vast distance, by the help of a leathern thong tied round the person's hand who threw it, and put through a hole in the middle. Homer has made Ajax and Ulysses great artists at this sport; and Ovid, when he brings in Apollo and Hyacinth playing at it, gives an elegant description of this exercise, lib. x. ver. 175.

Disc, in astronomy, the body and face of the sun and moon, such as it appears to us on the earth; or the body or face of the earth, such as it appears to a spectator in the moon, &c. The disc in eclipse is supposed to be divided into twelve equal parts, called digits: in a total eclipse of the luminaries, the whole disc is obscured; in a partial eclipse, only a part thereof. If we imagine a plane to pass through the centre of the earth, so that the line which joins the centres of the sun and earth, may be perpendicular to this plane, it will make on the surface of the earth a circle, which will separate the illuminated hemisphere of the earth from the dark. This circle, otherwise termed the circle of illumination, M. Keil calls the illuminated disc of the earth, which is directly seen by a spectator placed at the distance of the moon, in the right line which joins the centres of the sun and earth. All lines drawn from the centre of the sun to every single point of the disc are to be accounted parallel; and, therefore, since that line which is drawn to the centre of the disc is perpendicular to it, all the rest will be perpendicular to it, and therefore all lines drawn from the centre of the sun, and passing through every point of any circle upon the earth's surface,

when they are produced, will be perpendicular to the plane of the disc. Moreover, a spectator in the moon will see all countries, cities, and towns to move upon the disc, which motion is occasioned by the earth's rotation round its axis, and every point will have its way on the disc: the bigness of the earth's disc is to be estimated by the angle under which the earth is seen from the moon.

Disciple, one who learns any thing from another: thus, the followers of any teacher, philosopher, &c. are called disciples. In the Christian sense they were followers of Jesus Christ, in general; but in a more restrained sense, the disciples denote those alone who were the immediate followers and attendants on his person, of which there were seventy or seventy-two. The names *disciple* and *apostle* are often synonymously used in the gospel-history, but sometimes the apostles are distinguished from disciples as persons selected out of the number of disciples, to be the principal ministers of his religion; of these there were only twelve. The Latins kept the festival of the seventy or seventy-two disciples on July 15, and the Greeks on January 4.

Discord, in music, the relation of the two sounds which are always and of themselves disagreeable, whether applied in succession or consonance. Thus the second, fourth, and seventh, with their octaves, and, in general, all intervals, except those few which precisely terminate the concords, are called discords. Discords are distinguished into concinnous and inconcinnous intervals.

Discount, a compensation for the advance of money which is not due till after a certain period,

which in this country is at the rate of 5 per cent. per annum. Thus if a person is entitled to 100*l.* at the end of a year, he usually pays 5*l.* to get the money at present. This is rather too much, because the sum that ought to be given is 4*l.* 15*s.* $2\frac{1}{4}$*d.* only: for this improved will in a year amount to 5*l.* Upon this latter principle Smart's tables are calculated. In rough calculations one penny per pound, a month, is the discount on bills: thus a bill due 5 months hence of 50*l.* may be discounted for pence $50 \times 5 = 250$ pence $= £1.\ 0s.\ 10d.$

Discount, in commerce, a term among traders, merchants, and bankers. It is used by the two former on occasion of their buying commodities on the usual time of credit, with a condition that the seller shall allow the buyer a certain discount at the rate of so much *per cent. per annum*, for the time for which the credit is generally given, upon condition that the buyer pays ready money. Among bankers, it is an allowance for ready money upon a note or bill of exchange.

Dissenters, separatists from the services and worship of the church of England. At the revolution, a law was enacted, that the statutes of queen Elizabeth and king James I. concerning the discipline of the church, should not extend to the Protestant dissenters. Persons dissenting, however, are to subscribe the declaration of 30 Car. II. cap. 1. and take the oaths of fidelity, &c. Besides, they are not to hold their meetings till their place of worship is certified to the bishop, or to the justices of the quarter-sessions, and registered. Also, they are not to keep the doors of their meeting-houses locked during the time of divine-service.

And to secure to them the free exercise of their religion, whoever disturbs or molests them in the performance of divine worship, on conviction at the sessions, is to forfeit twenty pounds, by the statute of William and Mary. Unless dissenters conform and receive the sacrament, as administered by the church of England, they are excluded from holding any public places under the government. The dissenters, tolerated by law, may be reduced to four classes, *viz.* Presbyterians, Independents, Baptists, and Quakers; to which may be added another sect, which some years ago obtained a toleration in this country, namely, the Unitas Fratrum, or Moravians. The principles on which dissenters separate from the church of England, are the same with those on which she separates herself from the church of Rome; these are, the right of private judgment, liberty of conscience, and the perfection of Scripture as the Christian's only rule of faith and practice. They maintain that Christ, and he alone, is the head of the church, and that they bow to no authority in matters of religion, but that which proceeds from him. By ignorant people, dissenters are often treated with scorn, but by the liberal, and those who are capable of appreciating their merit and character, they have met with a better reception in all ages, since they thought it right to abandon their secular interests for the sake of preserving their integrity. Dr. Taylor, speaking of the Dissenters who were ejected from their livings by the licentious Charles II. in 1662, says "They were men prepared to lose all, and to suffer martyrdom itself, and who actually resigned their livings, rather than desert the cause of civil and re-

ligious liberty, which, together with serious religion, would, I am persuaded, have sunk to a very low ebb, had it not been for the noble stand which these worthies made against imposition upon conscience, prophaneness, and arbitrary power. They had the best education England could afford: most of them were excellent scholars, judicious divines, pious, faithful, and laborious ministers, undaunted and courageous in their Master's work, standing close to their people in the worst times, diligent in their studies, solid, affectionate, powerful, awakening preachers, aiming at the advancement of real vital religion in the hearts and lives of men, which flourished wherever they had influence."

DISTANCE, in astronomy. The real distances of the sun and planets are found from their parallaxes. See PARALLAX. With respect to the planets, as the distance of the earth from the sun has been found by transits of Venus to be 95 millions of miles; from this one distance and the periodic times of the planets, the respective real distances of the whole may be found by means of Kepler's law, "that the squares of the periodic times are as the "cubes of their mean distances from the sun."

DISTANCE, *apparent*, in optics, is that distance which we judge an object is placed at, when seen afar off, being usually very different from the true distance; because we are apt to think that all very remote objects, whose parts cannot be well distinguished, and which have no other object in view near them, are at the same distance from us, though perhaps the one is millions of miles nearer than the other, as is the case with regard to the sun and moon.

DISTANCE *of the eye*, in perspective, is measured by a line drawn from the eye to the principal point: but the "point of distance" is a point in the horizontal line at such a distance from the principal point, as is that of the eye from the same.

DISTANCE, as applied to the turf, is a length of 240 yards from the winning post of a race-course: precisely at which spot is fixed a post corresponding with others, but having a gallery capable of holding three or four persons, which is called the distance post. In this gallery as well as in that of the winning post, before the horses start each heat, a person is stationed holding a crimson flag; during the time the horses are running, each flag is suspended from the front of the gallery to which it belongs, and the flag is inclined forward as a horse passes either post. Now if there be any horse which has not come up to the distance post, before the first horse, in that heat, has reached the winning post, as is manifested by the motion of this flag, such horse is said to be "distanced," and is incapable of running any more during that race.

DISTILLATION, a chemical process, which consists in separating bodies which are volatile, from those that are more fixed, by the application of heat. All bodies which are capable of the vaporous form, at the same time that they are not decomposed, or otherwise changed in their properties, are capable of being separated from other matter by distillation. The process employed for distilling liquid bodies from other matter is simply called distillation, that on the contrary used to separate solid bodies, by giving them the elastic form, is

termed sublimation. The apparatus employed for the first process are of several kinds, suited to the nature of the volatile body. That employed for the distillation of water, alcohol, essential oils, simple waters, &c. is called a still, and may be thus described. It consists of a copper boiler inserted within brick-work. The materials to be distilled being introduced into the boiler, the still head B is fixed on. The fire being kindled, and the contents of the still made to boil, the spirit, &c. will rise in the form of vapour into the head, and passing over into the worm which is fixed in a tub of cold water, it is condensed into the liquid form, and will flow through the cock E into any vessel placed there to receive it. See Plate Miscellanies, fig. 16. The apparatus employed for distilling bodies more easily condensible, consist of two parts, one called a retort, containing the substance to be distilled and the other the receiver, because it receives the substance raised from the retort. See CHEMICAL *Apparatus*. In the distillation of bodies which afford permanent gases, as well as condensible matters, in addition to the receiver a number of connected vessels are employed, constituting what from its inventor, is called Woulfe's apparatus, in which, what is not condensed, or absorbed in the first bottle, passes forward to the second, and so on to the third or fourth, till at length the absolutely incondensible part is received into a vessel called a gazemeter. Before the invention of this apparatus, this kind of distillation was attended with much danger, the receiver being liable to burst, and the fumes being of the most pungent and suffocating nature. This inconvenience is completely

obviated by Woulfe's apparatus, which is thus described, fig. 17. A is a glass retort, adjusted to a round vessel B. To the opening of B is fitted a glass tube C, the other extremity of which is conveyed into the liquor, contained in the glass vessel D; with this are connected two or three, or more similar vessels, by means of glass tubes, and to the last orifice of the range of vessels, is adapted a bent glass tube E, which is conveyed under a receiver, placed upon the shelf of the pneumatic cistern. See CHEMICAL *Apparatus.*

Water is poured into the first of these vessels B; caustic potash into the next, or such other substances as are necessary for absorbing, as they pass along, the gasses, or any production foreign to the substance wanted to be obtained in purity. To obtain muriatic acid with this apparatus, put eight parts of clean muriate of soda, (common salt) reduced to fine powder, into the retort A. Add five parts of sulphuric acid, diluted with a little water. The vessel B will receive the impure sulphuric and muriatic acids, which pass over at the end of the operation. The series of bottles ought to contain a quantity of water, equal in weight to the salt employed. Heat being applied to the retort A, muriatic acid gas will be disengaged, which will mix with the water in the bottles, and form liquid muriatic acid. The tubes inserted in the middle of the bottles are called safety tubes, and are intended to allow some part of the gas to escape to prevent accidents. It is observable in distillation that one volatile substance will frequently carry along with it other bodies of considerable fixity. From the affinity which

water has to air, the evaporation of the former will take place at all temperatures below its boiling point, and though it has been thought that water might be freed from saline matter by distillation, it is found by experiment that several salts are carried over with the vapour of the water, which in their dry state would undergo decomposition before they would be induced to assume the elastic form. Hence water, by the common mode of distillation, cannot be rendered pure. From the circumstance, that the air is capable of raising water and other liquids at a low temperature, we are enabled to perform the distillation of such liquids by making a slight degree of difference of temperature between the retort and the receiver. Water and alcohol may be obtained perfectly pure, by placing the retort in the temperature of 100° and the receiver in that of 50° Fahrenheit.

Distraining, in law, the same with attaching, or *distress*.

Distress, in law, the seizing or distraining any thing for rent in arrear, or other duty unperformed. The effect of this distress is to compel the party either to replevy the things distrained, and contest the act of trespass against the distrainer; or rather to oblige him to compound and pay the debt or duty, for which he was so distrained. There are likewise compulsory distresses in actions, to cause a person to appear in court; of which kind there is a distress personal of his moveable goods, and the profits of his lands, for contempt in not appearing after summons: there is likewise distress real of a person's immoveable goods. In these cases none shall be distrained to answer for any thing

touching their freeholds, but by the king's writ. Distress may be either finite or infinite: finite distress is that which is limited by law, in regard to the number of times it shall be made, in order to bring the party to a trial of the action. Infinite distress is that which is without any limitation, being made till the person appears: it is farther applied to jurors that do not appear as upon a certificate of assise, the process is *venire facias*, *habeas corpora*, and distress infinite. It is also divided into grand distress and ordinary distress: of these, the former extends to all the goods and chattels that the party has within the county. A person, of common right may distrain for rents and all manner of services: and where a rent is reserved on a gift in tail, lease for life, or years, &c. though there be no clause of distress in the grant or lease so as that he has the reversion: but on the feoffment made in fee, a distress may not be taken unless it be expressly reserved in the deed.

Divan, a council-chamber, or court in which justice is administered, in the eastern nations, particularly among the Turks. There are two sorts of divans, that of the grand seignior, called the council of state, which consists of seven of the principal officers of the empire; and that of the grand vizir, composed of six other vizirs or counsellors of state, the chancellor, and secretaries of state for the distribution of justice.

Dividend, is the proportion of profits which the members of a society or public company, receive at stated periods according to the share they possess in the capital or common stock of the concern. The term is applied also to the annual interest paid by

government on various public debts, this however is by no means a division of profits. In this sense, the order by which stock-holders receive their interest is called a dividend warrant, and the portions of interest unreceived are denominated unclaimed dividends.

Dividing *instruments*, are contrivances invented for the purpose of making with accuracy the graduations upon astronomical and mathematical instruments.

Diving, the art of descending under water to considerable depths, and abiding there a competent time. The uses of diving are very important, particularly in the fishing for pearls, corals, sponges, &c. The most remarkable diver was Nicolo Pesce, who, according to the account given by Kircher, was able to spend five days together in the waves, without any other provisions than the fish which he caught and ate raw. He would swim from Sicily to Calabria, carrying letters from the king. At length he met his fate in exploring the depths of Charybdis, at the instance of the king; who, after he had once succeeded in fetching up a golden cup that had been thrown in, ordered him to repeat the experiment. There have been various engines contrived to render the business of diving safe and easy; the great point is to furnish the diver with fresh air, without which he must either make a short stay, or perish. Those who dive for sponges in the Mediterranean, carry down in their mouths sponges dipt in oil; but, considering the small quantity of air that can be contained in the pores of a sponge, and how much that little will be contracted by the pressure of the incumbent air,

such a supply cannot subsist a diver long, since a gallon of air is not fit for respiration above a minute.

Diving-*bell*, a machine contrived for the safe conveyance of a diver to any reasonable depth, and whereby he may stay more or less time under water, as the bell is greater or less. Dr. Halley's was three feet wide at top, and five at bottom, and eight feet high, and contained about sixty-three cubic feet, or near eight hogsheads in its concavity. This was coated with lead, so heavy, that it would sink empty, and the weight was distributed about the bottom; so that it would go down in a perpendicular position, and no other. In the top was fixed a strong but clear glass, to let in the light from above; and likewise a cock to let out the hot air that had been breathed; and below, was fixed a circular seat for the divers to stand on to do their business. This machine was suspended from the mast of a ship by a sprit, which was sufficiently secured by stays to the mast-head, and was directed by braces to carry it over-board, clear of the side of the ship, and to bring it in again. To supply the bell with air under water, two barrels, of about sixty-three gallons each, were made, and cased with lead, so that they might sink empty, each having a hole in its lowest part to let in the water, as the air in them is condensed in their descent, and to let it out again when they were drawn up full from below; and to a hole in the top of the barrel was fixed a hose, or hollow pipe, well prepared with bees-wax and oil, which was long enough to fall below the hole at the bottom, being sunk with a weight appended, so that the air in the upper part of the barrels could not escape, unless

the lower end of these pipes were first lifted up. These air barrels were fitted with tackle proper to make them rise and fall alternately, like to buckets in a well. In their descent they were directed by lines fastened at the under edge of the bell to the man standing on the stage to receive them, who, by taking up the ends of the pipes above the surface of the water in the bell, gave occasion for the water in the barrels to force all the air in the upper parts into the bell, while it entered below, and filled the barrels; and as soon as one was discharged, by a signal given, it was drawn up, and the other descended to be ready for use. As the cold air rushed into the bell from below, it expelled the hot air through a cock at the top of the bell, which was then opened for that purpose. By this method, air is communicated so quick, and in such plenty, that the doctor tells us, he himself was one of the five who was at the bottom in nine or ten fathoms water, for above an hour and a half at a time, without any sort of ill consequence; and he might have continued there as long as he pleased, for any thing that appeared to the contrary. In going down it is necessary it should be very gentle at first, that the dense air may be inspired, to keep up, by its spring, a balance to the pressure of the air in the bell: upon each twelve feet descent, the bell is stopped, and the water that enters is driven out by letting in three or four barrels of fresh air. By the glass above, so much light was transmitted, when the sun shone, that he could see perfectly well to write and read, and by the return of the air-barrels, he could send up orders, written with an iron pen, on small pieces of lead, directing, that

they were to be moved from place to place: but in the dark weather, when the sea was rough and troubled, it would be as dark as night in the bell; but then the doctor perceived he could keep a candle burning in the bell as long as he pleased, it being found, by experiment, that one candle consumes much about the same quantity of confined air, as one man does, viz. about a gallon per minute. The only inconvenience the doctor complained of was, that upon first going down, they felt a small pain in their ears, as if the end of a quill were forcibly thrust into the hole of the ear. This may proceed from its being some time before the air can get from the mouth, through the small canal of the eustachian tube, which leads to the inner cavity of the ear, where, when it comes, it makes an equilibrium with the outward air, pressing on the tympanum, and thus the pain, for a short time, ceases: then descending lower, the pain of the ear returns, and is again abated; and so on, till the bottom is gained, where the air is of the same density continually. This bell was so improved by the doctor, that he could detach one of his divers to the distance of fifty or a hundred yards from it, by a contrivance of a cap, or head-piece, somewhat like an inverted hand-basket, with a glass in the fore-part, for him to see his way through. This cap was of lead, and made to fit quite close about his shoulders: in the top of it was fixed a flexible pipe, communicating with the bell, and by which he had air, when he wanted, by turning a stop-cock near his head-piece. There was also another cock at the end in the bell, to prevent any accident happening from the person without. This

*Fig. 16.*

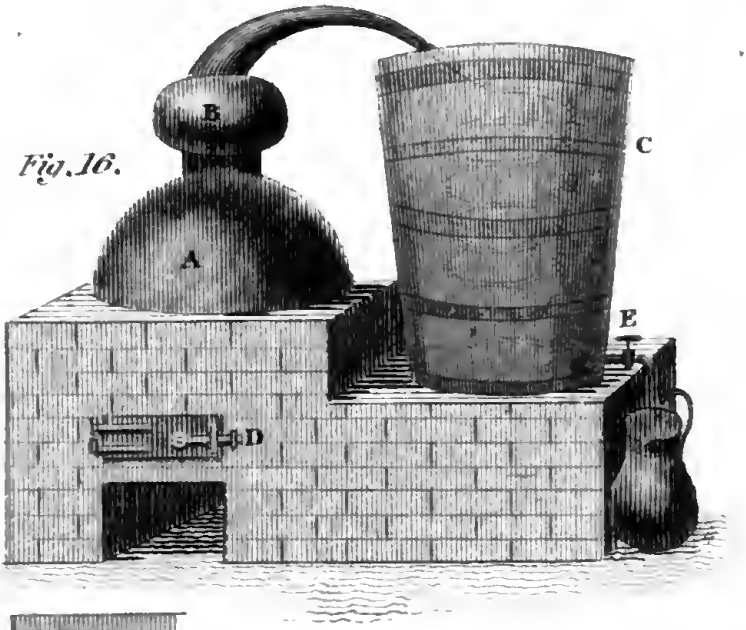



*Fig. 17.*

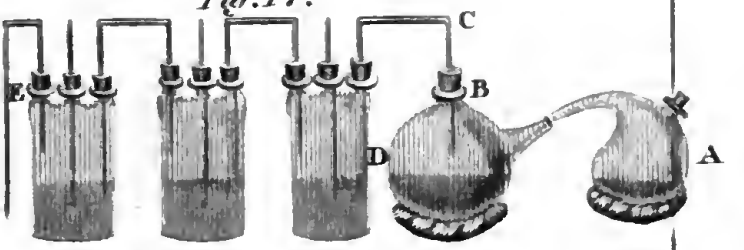



*Fig. 19.*

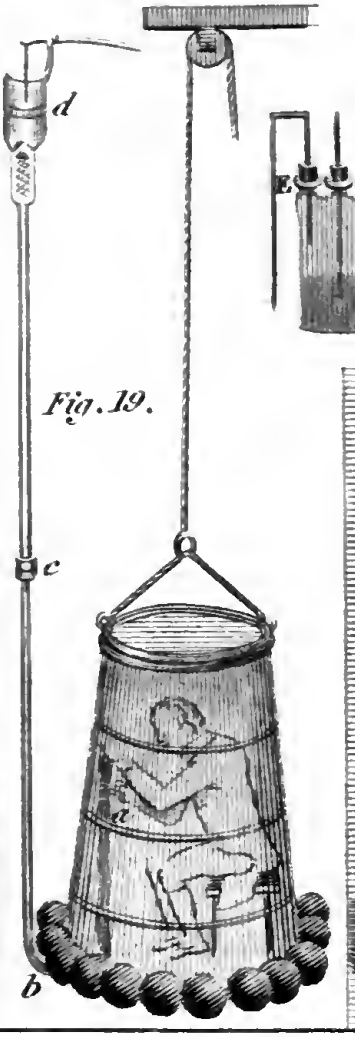
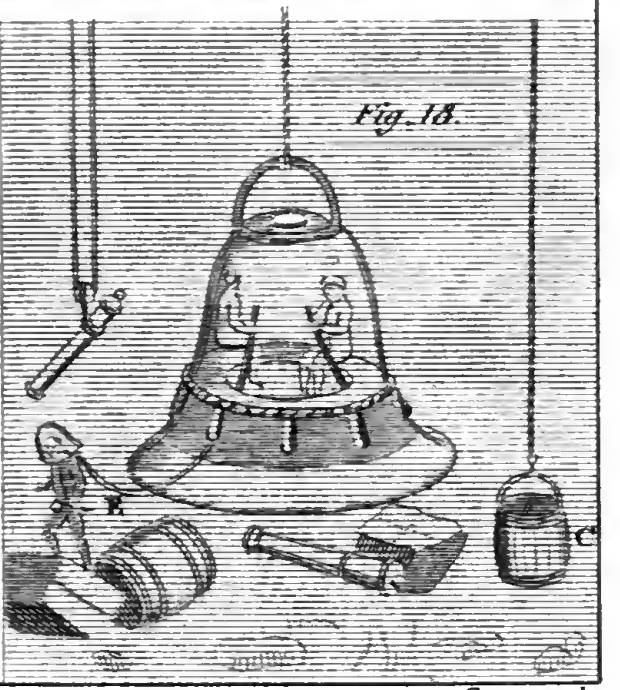



*Fig. 18.*




Cooper sculp.

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person was always well cloathed with flannels, which were warmed upon him before he left the bell, and would not suffer the cold water to penetrate. His cap contained air enough to serve him a minute or two, then by raising himself above the bell, and turning the cock, he could replenish it with fresh air. This pipe he coiled round his arm, which served him as a clue to find his way to the bell. See Plate Miscellanies, Figs. 18 and 19.

Divisibility, that property by which the particles of matter in all bodies are capable of separation, or disunion from one another. As it is evident that body is extended, so it is no less evident that it is divisible, for since no two particles of matter can exist in the same place, it follows, that they are really distinct from each other, which is all that is meant by being divisible. In this sense the least conceivable particle must still be divisible, since it will consist of parts which will be really distinct. Thus far extension may be divided into an unlimited number of parts, but with respect to the limits of the divisibility we are still in the dark. We can, indeed, divide certain bodies into surprisingly fine and numerous particles, and the works of nature offer many fluids and solids of wonderful tenuity; but both our efforts, and those naturally small objects, advance a very short way towards infinity. Ignorant of the intimate nature of matter, we cannot assert whether it may be capable of infinite division, or whether it ultimately consists of particles of a certain size, and of perfect hardness. We shall add a few instances of the wonderful tenuity of certain bodies, which have been produced either by art, or discovered by means of the microscope

among the works of nature. Mr. Boyle mentions that two grains and a half of silk was spun into a thread 300 yards long: and a lady spun from a pound of wool, a thread equal to 95 English miles in length.

The ductility of gold likewise furnishes a striking example of the great tenuity of matter, for a single grain of this metal has been actually divided into at least half a million of particles, each of which is perfectly apparent to the naked eye. The animal, vegetable and even mineral kingdom furnish numerous examples of the subtilty of matter. What for instance must be the tenuity of the odoriferous particles of musk, when we find that a piece of it will scent a whole room, in a short time, and yet will hardly lose any sensible part of its weight. The human eye, unassisted by glasses, can frequently perceive insects so small as to be barely discernible. Now it is obvious that the limbs, the vessels, and other parts of such animals, must infinitely exceed in fineness every endeavour of human art. But the microscope has discovered wonders that are vastly superior, and such indeed as were utterly unknown to our forefathers, before the invention of that instrument. Insects have been discovered so small as not to exceed the 10,000 part an inch in length: so that 1,000,000,000,000 of them might be contained in the space of one cubic inch: yet each little animal must consist of parts connected with each other: with vessels, with fluids, and with organs necessary for its motions, for its increase, and for its propagation. How inconceivably small must those organs be, and yet they are, unquestionably, composed of other parts

still smaller, and still farther removed from the perception of our senses.

DIURNAL, in astronomy, something relating to the day in opposition to nocturnal, which regards the night.

DIURNAL *arch*, the arch or number of degrees that the sun, moon, or stars describe between their rising and setting.

DIURNAL *motion of a planet*, is so many degrees and minutes as any planet moves in twenty-four hours. Hence the motion of the earth about its axis, is called its diurnal motion.

The diurnal phænomena of heavenly bodies, arise from the motion of the earth round its axis: for since the earth turns round its own axis from west to east, every spectator on its surface must necessarily be carried round in the same way; and consequently those parts of the heavens which lie toward the east, will by and by come into his sight, and those which are visible to him, will depart out of it toward the west. Hence it is that the spectator not being sensible of his own motion (the reason of which is, because all things about him move along with him), imagines the whole heavens to turn round the contrary way, *viz.* from east to west, every twenty-four hours, which is nearly the time in which the earth performs one revolution about its axis.

DOCK, in maritime affairs, is a pit, great pond, or creek, by the side of an harbour, made convenient either for building or repairing of ships. It is of two sorts: 1. Dry-dock, where the water is kept out by great flood gates, till the ship is built or repaired, when the gates are opened, and the water

let in to float and launch her. 2. Wet-dock, a place where the ship may be hauled into, out of the tide's way, and so dock herself, or sink herself a place to lie in.

Dock-yards, in ship-building, are magazines of all sorts of naval stores. The principal ones in England are those of Chatham, Portsmouth, Plymouth, Woolwich, Deptford and Sheerness. In time of peace, ships of war are laid up in these docks; those of the first rates mostly at Chatham, where, and at other yards, they receive from time to time such repairs as are necessary. These yards are generally supplied from the northern crowns with hemp, pitch, tar, rosin, &c. but masts, particularly those of the larger size, are brought from New England.

Docket, or *Dogget*, in law, signifies a brief in writing. The rolls of judgment, when brought into the court of common-pleas, are entered on the docket of that term: and attorneys keep docket-books, wherein they enter judgments.

Doctor, a person who has passed all the degrees of a faculty, and is impowered to teach or practise the same: thus we say, doctor in divinity, doctor in physic, doctor of laws. The title of doctor seems to have been created in the twelfth century, instead of *master*, and established with the other scholastic degrees of bachelors and licentiates, by Peter Lombard and Gilbert Porreus, then the chief divines of the university of Paris. Gratian did the same thing, at the same time at the university of Bologna. Though the two names of *doctor* and *master* were used a long time together, yet many think that their functions were different, the masters teaching

the human sciences, and the doctors those sciences depending on revelation and faith. Spelman takes the title of doctor not to have commenced till after the publication of *Lombard's Sentences*, about the year 1140, and affirms that such as explained that work to their scholars were the first that had the appellation of doctors.—To pass doctor in divinity at Oxford, it is necessary the candidate have been four years bachelor of divinity. For doctor of laws, he must have been seven years in the university to commence bachelor of law, five years after which he may be admitted doctor of laws. Otherwise in three years after taking the degree of master of arts, he may take the degree of bachelor of laws, and in four years more that of doctor: which same method and time are likewise required to pass the degree of doctor in physic. At Cambridge, to take the degree of doctor in divinity, it is required that the candidate have been seven years bachelor of divinity: though in several colleges the bachelor's degree is dispensed with; and he may go out *per saltum*. To commence doctor in laws, the candidate must have been five years bachelor of laws, or seven years master of arts. To pass doctor in physic he must have been bachelor in physic five years, or seven years master of arts. It is remarkable, that by a statute of 37 Henry VIII, a doctor of civil law may exercise ecclesiastical jurisdiction, though a layman.

Dodecagon, a regular polygon of 12 equal sides and angles. If the side of a dodecagon be 1, its area will be equal to 11.2 nearly, and the areas of plane figures being as the squares of their sides, therefore 11.2 multiplied by the square of the side

of any dodecagon will give its area. "To inscribe a dodecagon in a given circle:" carry the radius six times round the circumference, which will divide it into six equal parts, or will make a hexagon; then bisect each of those parts, which will divide the whole into 12 parts, for the dodecagon.

DODECAEDRON, one of the Platonic, or five regular bodies, being contained under a surface composed of twelve equal and regular pentagons. See p. 260, vol. I.

DOG, an animal well known for its attachment to mankind. The facility with which it becomes the companion of the human race, and acquires almost any habits, evinces that this is the design of its creation, though it is by no means unqualified to subsist in a wild state. There, it is a beast of prey, of the wolf kind, clearing the earth of carrion, and living in friendship with the vulture.

Tamed and educated by man, the numerous good qualities of dogs have claimed and received the tribute of universal praise. Their sensibility is extreme: witness their susceptibility of the slightest rebuke, and restless anxiety to be restored to favour. A still greater proof, is the lively sense they take, the concern, in the one case, and the satisfaction in the other, in the pain or sorrow, the comfort or pleasure, of those with whom they are intimate. Corrected, they seldom resent blows with anger, and never with sullenness: they only desire to be forgiven.

A dog sees nothing in the world but his master, and, so long as the link is unbroken, imagines his existence to depend upon him. These are the true characteristics of affection; hence, he follows him

through all fortunes, forsaking him neither for fatigue, hunger, ill-usage, or neglect. He who has once used him well, he is never disposed to leave. In all this, there is something of self-interest, but this is not the whole:—his gratefulness is extreme. Not only feeling, but intelligence, also, belongs to the dog. If he supposes the property, or even person of his master to be in danger, he acts not only with promptitude and zeal, but with the most admirable propriety; and on these occasions his understanding is so evident that, what is very remarkable, we almost seem to think it an incongruity in nature that he is without an articulate voice; and this deficiency can never strike us but where an animal, as the common expression is, *does all but speak.*

Of these dispositions and qualifications we are in part convinced by the most ordinary experience; but they have been illustrated in an unusual manner in instances of which we have authentic narratives, and which are never read without applause and sympathy. The careful tenderness with which the Newfoundland dog seizes the body of a drowning sailor (so as to do him the least possible injury with his teeth); and the sagacious and moderate manner in which the mastiff secures him who he suspects to be a thief, are constant habits that have been witnessed by thousands. The skill of several species in the chase, where they act as the purveyors of man; their domestic habits; their kindness to children; in a word, their general congeniality with man himself, have, in all ages, recommended them to his use and care; and if in this association the dog has fulfilled his part with constancy and

warmth, mankind has not been insensible to his virtues, and unabating attachment. By the rich he has been loaded with luxuries; by the poet he has been praised; and the virtuous beggar, when he has parted with the companion of his misery, has accompanied the hard sacrifice to his necessity with the sincerest tears.

The shepherd's dog, is considered by Buffon as the parent stock whence all the species of the canine race have sprung; and that naturalist corroborates his idea by observing that they appear originally disposed, independently of education or habit, to take care of herds.

Zoologists reckon twenty-three canine species, among which are included the wolf, the hyæna, the jackal, and the fox. The *varieties* of dogs are almost without end. Of the *faithful dog*, alone, there are thirty-five varieties, and numerous subvarieties. The mastiff, as peculiar to England, is called the *English dog*. See Canis.

Doge, the chief magistrate in the republics of Venice and Genoa. The dignity is elective in both places: at Venice it continues for life, at Genoa it is only for two years. His title is "his serenity:" he is chief of the council, and mouth of the republic, he being to answer for her. The Venetians do not go into mourning at his death, being only the phantom of majesty, as all the authority is vested in the republic; the doge only lends his name to the senate; the power is diffused through the whole body, though answers to foreign ambassadors, &c. are made in the name of the doge. The money is struck in his name, but does not bear his arms. All the magistrates rise and salute him when he comes

into the council: but he rises to none but foreign ambassadors. He must not stir out of Venice, without leave of the counsellors, &c.

Domesday, or *dooms-day-book*, a very antient record made in the time of William the conqueror, which now remains in the exchequer, and consists of two volumes, a greater and a less; the greater contains a survey of all the lands in most of the counties in England, and the less comprehends some counties that were not then surveyed. The book of domes-day was begun by five justices, assigned for that purpose in each county, in the year 1081, and finished in 1086. It was of such authority, that the Conqueror himself submitted, in some cases wherein he was concerned, to be determined by it. Cambden calls this book the Tax-book of king William; and it was farther called *Magnu rolla*. There is likewise a third book of domes-day, made by command of the Conqueror; and also a fourth, being an abridgment of the other books.

Dominical letter, in chronology, is that letter of the alphabet which points out in the calendar the Sundays throughout the year, thence also called *Sunday letter*. See *Kalendar*. The distribution of days into weeks is marked by the seven first letters of the alphabet, A, B, C, D, E, F, G, beginning, at the first of January, to place the letter A; to the second of January B is joined; to the third C; and so on to the seventh, where G is figured: and then again beginning with A, which is placed at the eighth day, B will be on the ninth, C at the tenth, and so continually repeating the series of these seven letters, each day of the year has one of them

in the calendar. By this means the last day of December has the letter A joined to it, for if the 365 days, which are in a year, be divided by seven, we shall have fifty-two weeks, and one day over. If there had been no day over, all the years would constantly have fallen on the same day of the week, and each day of the month would constantly have fallen on the same day of the week: but now, on account, that besides the fifty-two weeks in the year, there is one day more, it happens, that on whatever day of the week the year begins, it ends upon the same day, and the next year begins with the following day. The letters being ranked in this order, that letter which answers to the first Sunday of January, in a common year, will show all the Sundays throughout the year, and to whatever days in the rest of the months, that letter is put, these days are all Sundays. If the first day of January be on a Sunday, the next year will begin on Monday, and the Sunday will fall on the seventh day, to which is annexed the letter G, which therefore will be the Sunday letter for that year; the next year beginning on Tuesday, the first Sunday will fall on the sixth of January, to which is adjoined the letter F, which is the Sunday letter for that year; and in the same manner, for the next following, the dominical letter will be E; and so on. By this means the Sunday letters will go on in a retrogade order, viz. G, F, E, D, C, B, A. But because every fourth year consists of 366 days, the series of letters will be interrupted, and the order will not return till twenty-eight years, or four times seven; and hence arises the cycle of twenty-eight years. See CYCLE *of the sun.*

Thus, if in a leap year, the first of January be Sunday, and consequently the dominical letter A, the twenty-fourth day of February will fall on a Friday, and the twenty-fifth on a Saturday; and since both these days are marked in the calendar with the letter F, the following day, which is Sunday, will be marked with G, which letter will mark out all the Sundays, and consequently be the dominical letter the remaining part of the year; and hence it is that every leap year has two dominical letters, the first of which serves from the beginning of the year to the twenty-fourth or twenty-fifth day of February, and then the other takes place and serves for the rest of the year. The intercalary day is placed between the twenty-third and twenty-fourth day of February, and so makes two twenty-fourths of February, which in the calendar are esteemed one and the same day, and have the same letter affixed to them; but by our way of reckoning, they are called the twenty-fourth and twenty-fifth days of February. The dominical letter may be found by the following rule, for any year of any century:

"Divide the centuries by four, and twice what does remain,
Take from six; and then add to the number you gain,
Their odd years and their fourth, which dividing by seven,
What is left take from seven, the letter is given."

Thus for the year 1811 the dominical letter is F, for the centuries, 18, divided by 4, leave 2, the double of which taken from 6 leaves 2 again, to which add 11, the odd years, and their fourth part 2, the sum 15 divided by 7 leaves 1, which taken

from 7 leaves 6, answering to F, the sixth letter in the alphabet.

Dominicans, an order of religious, called in France, jacobins, and in England, black friars, or preaching friars. This order, founded by St. Dominic, a native of Spain, was approved by Innocent III. in 1215, and confirmed by a bull of Honorius III. in 1216. The design of their institution was, to preach the gospel, convert heretics, defend the faith, and propagate Christianity. They embraced the rule of St. Augustine, to which they added statutes and constitutions, which had formerly been observed either by the Carthusians or Præmonstratenses. The principal articles enjoined perpetual silence, abstinence from flesh at all times, wearing of woollen, rigorous poverty, and several other austerities. This order has spread into all the parts of the world. It has produced a great number of martyrs, confessors, bishops; and they reckon three popes, sixty cardinals, 150 archbishops, and 800 bishops, of their order, besides the masters of the sacred palace, who have always been dominicans. They are inquisitors in many places. The nuns or sisters of this order, owe their foundation to St. Dominic himself, who built a monastery at Prouilles, where poor maids might be brought up and supplied with all necessaries for their subsistence. The habit of these religious was a white robe, a tawny mantle, and a black veil. Their founder obliged them to work at certain hours of the day, and particularly to spin yarn and flax to make their own linen. The nuns of this order have 130 houses in Italy, forty-five in France, fifty in Spain, fifteen in Portugal, forty in Germany, and

many in Poland, Russia, and other countries. They lie on straw beds, and never eat flesh excepting in sickness; but many monasteries have mitigated this austerity.

DORMANT, in heraldry, is used for the posture of a lion, or any other beast lying along in a sleeping attitude, with the head on the fore paws, by which it is distinguished from the couchant, where, though the beast be lying, yet he holds up his head.

DOVE-*tailing*, in carpentry, is the manner of fastening boards together by letting one piece into another, in the form of the tail of a dove. The dove-tail is the strongest of the jointings, because the tenon, or piece of wood which is put into the other, goes widening to the extreme, so that it cannot be drawn out again by reason of the extreme being larger than the hole.

DOWN, the shortest, smoothest, softest, and most delicate feathers of birds, particularly of geese, ducks, and swans, growing on their neck and part of the stomach. Down is a commodity of most countries, but that from the north of Europe is in the most repute. There is also the ostrich's down, otherwise ostrich's hair, used in the manufacture of hats, and coarse white cloth.

DOWN DERRY DOWN, or *derry down*, a famous burden of more than one English ballad, is justly observed by a writer in the *Monthly Magazine*, Vol. V. to have no meaning in that language. He suggests, at the same time, its Welsh original; and offers the following elucidations:

*Y deri down* (pronounced, Hey derry down);
To the oaks we will come.
*Down i'r deri;* and *Down y deri;*
We will come to the oaks;

*Down, down, i'r deri down ;*
We will come, we will come, to the oaks we will come:
*Down y deri, down ;*
We will come to the oaks, we will come.

The same author observes that, from an examination of the economy of the ancient Britons, it would appear that a considerable part of their wealth consisted in numerous herds of swine, which were fed upon acorns in the woods.—The proverb is common—

*Lawn meiziad wrh nzenaid gwynt ;*

The swineherd is glad at the sighing of the wind; *i. e.* He is glad, because the acorns are blown down.

Draco volans, a flying dragon in meteorology, a fiery exhalation, frequent in marshy and cold countries. It is most common in summer, and though principally seen playing near the banks of rivers, or in boggy places, yet sometimes mounts up to a considerable height in the air, to the no small terror of the amazed beholders; its appearance being that of an oblong, sometimes roundish, fiery body, with a long tail. It is entirely harmless, frequently sticking to the hands and cloaths of people without injuring them in the least. There is, likewise, a "draco volans," an insect, found in Africa and India, and distinguished from the lizard tribe, merely by having a broad, lateral membrane, strengthened by radii or bony processes: it wanders about trees, and is able, by means of the membrane, to spring from bough to bough, and support itself for a few moments in the air; it feeds on insects. It is in every respect a harmless and inoffensive animal, and in its very limited power of

flying resembles the flying squirrel or the bat. This representation of the flying dragon is totally different from what must be expected by those who are unacquainted with natural history, and whose ideas of the dragon are formed on the creations of poetry and romance. Though little adapted to excite terror, the flying dragon is well calculated to gratify curiosity. See Pl. Nat. Hist. Fig. 14.

Dragoman, *Drogman*, or *Druggerman*, a name given in the Levant to the interpreters kept by the ambassadors of Christian nations, residing at the Porte, to assist them in treating of public affairs.

Dragon's-blood, in pharmacy, a moderately heavy resin, of which there are two kinds: the one firm and compact, brought in lumps, of an inch long or more, and about half an inch in diameter; these are wrapped up in certain long and narrow leaves, and are called the drops, or tears, of dragon's blood. The other is brought in larger masses or cakes, of an irregular figure. The genuine dragon's blood is the fruit of a tall tree of the palm-kind, common in the island of Java, and some other parts of the East Indies.

Dragoon, in military affairs, a musqueteer, mounted on horseback, who sometimes fights or marches on foot, as occasion requires. Dragoons are divided into brigades, as the cavalry, and each regiment into troops; each troop having a captain, lieutenant, cornet, quarter master, two serjeants, three corporals, and two drums. Some regiments have hautboys: they are very useful on any expedition that requires dispatch, for they can keep pace with the cavalry, and do the duty of infantry: they encamp generally on the wings of the army,

or at the passes leading to the camp; and sometimes they are brought to cover the general's quarters: they do duty on the generals of horse and dragoons, and march in the front and rear of the army.

Drama, a poem, or theatrical representation of some certain action, and representing a true picture of human life, for the delight and improvement of mankind. The principal species of the drama are two, comedy and tragedy. "It is impossible to ascertain," says an anonymous writer, "the exact period when theatrical amusements were first introduced into England; they are mentioned as having existed very early by William Fitz-Stephen, a monk of Canterbury, in his *Descriptio nobilissimæ civitatis Lundonæ*, written soon after the year 1170. "*Lundonia pro spectaculis theatralibus, pro ludis scenicis, ludos habet sanctiores, repræsentationes miraculorum quæ sancti confessores operati sunt, seu representationes passionum, quibus claruit constantia martyrum.*"—London, instead of common interludes belonging to the theatre, has plays of a more holy subject: representations of those miracles which the holy confessors wrought, or of the sufferings wherein the glorious constancy of the martyrs did appear. These representations being mentioned as neither new nor uncommon, we may reasonably conclude them to be of a date still more ancient; and they continued a long time after to be the only subjects for the drama; in which Pater Cœlestis, or The Heavenly Father, Our Blessed Saviour, The Virgin Mary, The Twelve Apostles, &c. were the leading characters. In the year 1378 the scho-

lars of Paul's School presented a petition to king Richard II. praying him to prohibit some inexpert people from presenting the History of the Old Testament, to the great prejudice of the said clergy, who had been at great expence in order to represent it at Christmas. On the 18th of July, 1390, the parish clerks of London (by which expression we are to understand, *The Clergy*) played interludes at the Skinner's Well, near Clerkenwell; which continued three days: king Richard II. his queen, and nobles being present. And in the year 1409 they performed a play at the Skinner's Well, the subject being The Creation of the World; which lasted eight days: having the chief nobles and gentry of England for their audience. These *Mysteries*, as they were denominated, were followed by a species of the drama, stiled *Moralities*, in which the senses, passions, affections, virtues, and vices, were personified, and constituted the characters: these being of a moral turn, and contrived to entertain as well as instruct, soon exhibited some dawnings of poetry, with occasional attempts at wit and humour, which naturally introduced *comedy*: the earliest English piece, meriting that title, is *Gammer Gurton's Needle*, written by Dr. Still; performed at Christ's college, Cambridge, and printed in 1551. *Tragedy* soon after appeared with becoming dignity in *Ferrex* and *Porrex*, otherwise *Gorboduc*; written by Thomas Sackville and Thomas Norton; the former, who was afterwards lord Buckhurst, &c. was also author of the admirable Induction to the Complaint of Henry Duke of Buckingham, in *The Mirror for Magistrates*. This noble and pathetic tragedy was acted before

queen Elizabeth, Jan. 18, 1561; was spuriously printed in 1565, and afterwards, under the author's inspection, in 1570 or 1571. At this period a fool was almost indispensible on the stage, not only in comedies but also in the deepest tragedies; of which character no dramatic writer has availed himself more successfully than Shakspeare: his *Touchstone* in *As you like It*, and *Fool* in *King Lear* being, among many others which he produced, remarkable instances. In the infancy of the stage the players were priests; afterwards retainers to noblemen, under the sanction of whose name they performed; at length they were embodied and incorporated under royal authority: and, in the end, restricted and protected by acts of parliament, framed for the preservation of order and decorum in themselves; and their safety and encouragement in the exhibitions of the scenic art. When the *Mysteries* were the only dramatic performances, the stage, as is still the custom at Pekin, consisted of three distinct platforms, raised one above another; on the uppermost sat the *Pater Cœlestis*, surrounded with his angels; on the second appeared the glorified saints; and the lowest was occupied by mere men, who had not yet quitted "the smoke and stir of this dim spot." On one side of this lowest platform was the resemblance of a dark and pitchy cavern, whence issued an appearance of fire and flames; and, when necessary, the audience were stunned by hideous yellings, imitative of the howlings of wretched souls, tormented by relentless demons, who frequently ascended through the mouth of the cavern to delight the spectators with their buffooneries,

and to instruct them, by their remorseless cruelty to the condemned, carefully to shun the commission of such crimes, as might plunge themselves into a similar predicament. In an improved state of the theatre, when regular plays were introduced, the cavern, with its concomitant, though heterogeneous, mixture of horror and mummery, was abolished; the uppermost platform, and its celestial *personæ*, also disappeared; two platforms only remaining, which continued in use a considerable time; the upper one serving for galleries, ramparts, or any other elevated situation, from which some of the actors might discourse with others, standing on the lower one now called *the stage*.

The characters from the earliest times to that of the restoration were personated by men or boys; at which period Mrs. Hughes was the first female who appeared in a regular drama, in the character of Desdemona: unless, as Mr. Malone with great appearance of probability conjectures, Mrs. Sanderson (afterwards Mrs. Betterton) may claim priority. The stage decorations and ornaments (if they may be so called) were formerly very homely; a piece of old tapestry serving for the scene; which you was to imagine, as the story of the drama required, represented a street, a grove, a castle, or the ocean: the stage was strewed with rushes, and the dresses made of buckram and baize, laced with lacquered leather: but what better could be expected for the prices taken? for at so low a rate as *two-pence* were some of the seats in our ancient theatres; there were others at 6*d*. 1*s*. and (the highest) 2*s*. 6*d*. Some of the audience sat on stools upon the stage; drank wine and beer,

cracked nuts, and smoked tobacco during the performance. The *Mysteries* were frequently represented in churches, and on the sabbath; which practice it is thought was continued even after profane subjects had been introduced: the playing in churches was restrained by bishop Bonnor, in 1542, but the acting of plays on the sabbath-day continued till the reign of Charles I. at which period the players generally began to act at three o'clock in the afternoon, that the whole might be performed by day-light. The *Mysteries* seem in later times to have furnished the ground-work for another noted stage-performance, entitled *a puppet-show;* as appears from the following bill, printed in the reign of queen Anne; taken from the collection of title pages in the Harleian library, marked 5931:

"By her majesty's permition, at Heatly's booth, over against the *Cross Daggers*, next to Mr. Miller's booth, during the time of *Bartholomew-fair*, will be presented a little opera, called The *old Creacion of the World* new revived, with the addition of the glorious *battle* obtained over the *French* and *Spaniards* by his Grace the Duke of *Marlborough*. The contents are these, 1. The creation of *Adam*, and *Eve*. 2 The intrigues of *Lucifer* in the garden of *Eden*. 3. *Adam* and *Eve* driven out of *Paradice*. 4. *Cain* going to plow; *Abel* driving sheep. 5. *Cain* killeth his brother *Abel*. 6. *Abraham* offereth up his son *Isaac*. 7. Three wise men of the *East*, guided by a star, come and worship *Christ*. 8. *Joseph* and *Mary* flee away by night, upon an ass. 9. King *Herod's* cruelty; his *men's* spears *laden* with *children*. 10. Rich *Dives* in-

vites his *friends*, and orders his *porter* to keep the beggars from his gate. 11. Poor *Lazarus* comes a begging at rich *Dives* gate, the dogs lick his sores. 12. The good Angel and Death contend for *Lazarus's* life. 13. Rich Dives is taken sick and dieth; he is buried in great solemnity. 14. Rich *Dives* in Hell, and *Lazarus* in Abraham's bosom, seen in a most glorious object, all in machines descending in a throne, guarded with multitudes of angels; with the breaking of the clouds discovering the palace of the sun, in double and treble prospects, to the admiration of all the spectators."

Drank, among farmers, a term used to denote wild oats, which never fail to infest worn-out lands; so that when plowed lands run to these weeds and thistles, the farmer knows it is high time to fallow them, or else to sow them with hay-seed, and make pasture of them. Some, indeed, destroy the drank, by sowing the lands with beans, and letting loose sheep upon them when young. This must be done in dry weather, and the sheep eat up the drank and other weeds, without touching the beans.

Drapery, in sculpture and painting, the representation of the clothing of human figures, and also hangings, tapestry, curtains, and most other things that are not flesh or landscape.

Draught, in trade, called also cloff or clough, is a small allowance on goods that are sold by weight, made by the king to the importer, or by the seller to the buyer, that the weight may hold out when the goods are weighed out by retail.

Draught is a term used in medicine for certain mixtures very useful in life: these are chiefly *emetic* draughts consisting of ipecacuanha in powder

mixed with water; 15 or 20 grains are sufficient for adults:—*Laxative* draughts are made of many articles; Epsom Salts prove as useful as most things, and may be used from 3 or 4 to 8 or 9 drams in moderately warm water. *Saline* draughts: take of salt of tartar one scruple, lemon juice half an ounce, or one scruple of the concrete juice, water an ounce, antimonial wine 10 or 12 drops. Pour the lemon juice upon the salt, and when the effervescence has ceased add the rest. It may be sweetened with sugar or simple syrup. A draught to promote *perspiration* may be thus prepared: Take of Mindererus' spirit, or liquor of acetated ammonia, half an ounce, spearmint water one ounce, antimonial wine 10 or 12 drops, mix them together, and let the whole be taken at bed-time.

Draw-back, in commerce, certain duties, either of the customs or of the excise, allowed upon the exportation of some of our own manufactures; or upon certain foreign merchandize, that have paid duty on importation. Drawbacks are paid by the collector of the customs at the port where the goods are exported, on producing a debenture authenticated by the proper officers as the voucher for the payment. Drawbacks prevent the natural tendency of capitals from being deranged by taxation. When the duties paid on the importation of sugar, tobacco, &c. are returned on their exportation, the trade in those articles is only replaced on the situation it would have been in, if the articles had not been taxed. A still more equitable arrangement than that of draw-backs, is to allow the merchant, who imports any commodity which he may probably wish to export again, to deposit it in the King's

warehouses, giving bond for the payment of duties, should he dispose of it for home consumption. This is called "bonding," and is allowed to some extent.

Drawing, the art of representing the appearances of objects upon a flat surface, by means of an outline which describes their form, and shadow, which shews them round, prominent, near, distant, &c. The learner cannot be too strongly recommended to encounter the difficulty of using only a free stile; for, though the pencil may thus seem much less manageable, than if handled in a cramped manner, this obstacle is as quickly overcome as any other, and the consequent advantages great and lasting. In acquiring the command of the pencil, and a knowledge of the forms of bodies, large and distinct examples should be copied. In shadowing with India-ink, &c. large hair pencils should be used, which, if good, have as fine a point as any other, and water should never be spared. What we have drawn large, we can draw small; but what we have drawn only small, we shall find ourselves very much at a loss to describe on a larger scale. We should copy both nature and good imitations of it, and improve ourselves by both: for though drawing is as it were a universal faculty, and nature a universal model, yet it avails us much to know how others have imitated it. We are free to improve upon former methods, but it is well that we should know them; it is necessary, meanwhile, that we should be acquainted with nature ourselves, that we may discover their imperfections or be truly sensible of their merits. Besides the knowledge of simple outline, the more scientific power

of delineating that which, independently of shadow, is necessary to describe projection, must be attained. This, which is always dependent on the principles of "perspective," is, in representations of animals and many other objects, called "foreshortening." See PERSPECTIVE.

DREAMS have been described as the imaginations, fancies, or reveries of a sleeping man, and they are said to be deducible from the three following causes: 1. The impressions and ideas lately received, and particularly those of the preceding day. 2. The state of the body, particularly the stomach and brain; and, 3. Association. That dreams are, in part, deducible from the impressions and ideas of the preceding day, appears from the frequent recurrence of these, especially of the visible ones in our dreams; in general, ideas that have not affected the mind for some days, recur in dreams only from the second and third causes. That the state of the body affects our dreams is evident from the dreams of the sick and of those who labour under indigestions, spasms and flatulencies: and a little observation will shew that we are carried on from one thing to another in our dreams partly by association. In proof of what we have advanced we may observe, 1st. That the scenes which present themselves in dreams are taken to be real; and we suppose ourselves present and actually hearing and seeing what passes, which is occasioned, by there being no other reality to oppose to the ideas which offer themselves, whereas in the common fictions of the fancy, while we are awake, there is always a set of real external objects, striking some of our senses and precluding a little mis-

take there. Again, the trains of visible ideas which occur in dreams are far more vivid than common visible ideas, and may therefore be more easily taken for actual impressions. 2ndly, There is a great wildness in our dreams; for the brain during sleep is in a state so different from that in which the usual associations were formed, that they can by no means take place during vigilance. 3rdly. We do not take notice of, or are offended at any inconsistencies, but pass on from one to another. For the associations which should lead us thus to take notice and be offended, are, as it were, asleep; the bodily causes also hurrying us on to other and new trains successively. But if the bodily state be such as favours ideas of anxiety and perplexity, then the inconsistency and apparent impossibility occurring in dreams are apt to give great disturbance and uneasiness. 4thly. It is common in dreams for persons to appear to themselves to be transferred from one place to another, by a kind of sailing or flying motion. This arises from the change of the apparent magnitude and position of the images excited in the brain; this change being such as a change of distance and position in ourselves would have occasioned. 5thly. The dreams which are presented in the first part of the night are for the most part much more confused, irregular and difficult to be remembered than those which we dream towards the morning, and these last are often rational to a considerable degree, and regulated according to the usual course of our associations: For the brain begins then to approach to the state of vigilance and that in which the usual associations

were formed and cemented. However association has some power in wild and inconsistent dreams.

Dredger, the term used in the admiralty-court for an oyster-fisher.

Drift *of the forest*, is an exact view and examination taken at certain times to know what beasts are there; in order that none may come on the forest but such as have right; and that the forest be not overcharged with beasts.

Drift, in mining, a passage cut out under the earth, betwixt shaft and shaft, or turn and turn; or a passage or way, wrought under the earth, to the end of a meer of ground, or part of a meer.

Drift sail, a sail used under water, veered out right a-head by sheets, as other sails are. It serves to keep the ship's head right upon the sea in a storm, and to hinder her driving too fast in a current.

Drill, in mechanics, a small instrument for making such holes as punches will not conveniently serve for. Drills are of various sizes, and are chiefly used by smiths and turners.

Drill, *or* drill-box, a name given to an instrument for sowing land in the new method of horse-hoeing husbandry. It plants the corn in rows, makes the channels, sows the seeds in them, and covers them with earth when sown; and all this at the same time, and with great expedition. The principal parts are the seed-box, the hopper, the plough and its harrow, of all which the seed-box is the chief. It measures, or rather numbers, out the seeds which it receives from the hopper, and is for this purpose as an artificial hand; but it deli-

vers out the seed much more equally than can be done by a natural hand. See PLOUGH. Whoever is desirous of knowing more intimately the whole apparatus for this method of sowing, may see it fully described, and illustrated with figures, by Tull, in his *Horse-hoeing husbandry*.

DRINK, a part of our ordinary food in a liquid form, serving to dilute and moisten the dry meat. See FOOD. With respect to the abuse of drink, the liberty is taken of quoting a passage from Dr. Beddoes, "On the Constitution and Management of the Human Body:"

"I allude here, as you will perceive, to the poison of fermented liquors. How wretchedly the drunkard usually perishes, you are not to be told. The miseries which the sot, in trying to compound with excess, entails upon his declining years, are somewhat less notorious. But the damage sustained by persons who, without belonging to either of these disreputable classes, have not been properly initiated in the discipline of temperance, is least of all suspected, though most deserving to be understood. The mode of living in our English universities, accompanied by the subsequent history of the members, would most completely exemplify the evil. There is nothing in the manners of the age to urge the daring spirit of youth to frequent intoxication. It is therefore to be expected that greater sobriety should come to prevail in those seminaries; and I believe all observers will agree, that this is remarkably the fact. The more opulent students, however, almost without exception, assemble in the afternoon, and partake of the fiery wines of Portugal, or some mixture that passes

for such, and is not *less* pernicious from its strength. Others find an equivalent. The practice by slow degrees abolishes every enviable distinction of the prime of life. The whole exterior is visibly affected; and the combined talents of the painter and the philosophical anatomist could probably contrive to represent this gradual waste of youth. Signs betokening impaired alacrity, and the substitution of gloominess in the place of gaiety, begin soonest to appear. The next injury is, the loss of the happy faculty of being easily pleased. The general feeling of existence soon afterwards becomes incessantly uneasy, and the spirits, except when supported by conviviality or some elaborate amusement, constantly droop. Other excesses may help to consume the Promethean fire; and although no single circumstance will account for the general sadness of the English character, the abuse of strong beer and wine is doubtless among the principal causes. The few healthy Englishmen at least who have always refrained from them, seem by no means deficient in cheerfulness; so that the bacchanalian who declared that he would not keep company with any man that drank water but his cousin Waller (*Life of Waller the poet*), had probably no other water-drinker among his acquaintance. Do not the nations, descended from the same ancestors, differ from us at present as widely in this article of temperance as in dramatic liveliness of demeanor, and in a disposition

"To frisk beneath the burthen of four-score?

"You may wish to know what evil is portended by the gloom which I have described as beginning to gather so early. The upshot depends upon pe-

culiarities of constitution which we are not able to ascertain, and on accidents which we cannot foresee. As these shall dispose, it may be madness, dropsy, or palsy, preceded by the tortures of the gout. The least formidable termination is in hypochondriasis, of which thousands carry away the seeds from the seat of their academical studies. As long as they persevere in the pernicious habit, which perhaps unsuspectedly has taken root there, the advantages of a country residence, which so frequently falls to their share, can afford them no relief. The continual depression, which, together with indigestion, forms this harrassing disorder, pursues them to their retirement; and occasionally is aggravated to feelings of insupportable horror.'

Drosera, in botany, a genus of plants, herbaceous and of small size, and very singular in their structure. The leaves are furnished with glandulous hairs on the upper surface, and fringed round the edge: these hairs have each a small globule of pellucid liquor like dew, continuing even in the hottest part of the day, and in the fullest exposure to the sun. Hence the English name "the sun-dew." The Drosera acaulis has a sessile flower in the bosom of the root leaves. These plants have the property of entrapping small insects within their folded leaves. This fact was discovered by Mr. Whately, who observed a fly in close imprisonment, in one of the contracted leaves, and on centrically pressing other leaves still in their expanded form, with a pin, he observed a sudden elastic spring of them so as to become inverted upwards, and as it were encircling the pin.

Drowning, signifies an extinction of life, by a

total immersion in water. In some respects there seems to be a great similarity between death occasioned by immersion in water, and that by strangulation, suffocation in fixed air, apoplexies, &c. In all these cases, and in drowning, there is often such a suspension of the vital powers, as has the appearance of a total extinction of them, but nevertheless they may, by proper remedies, be set in motion again and the subject be restored to life; we shall in this place give some directions with respect to persons apparently drowned. In removing the body to a convenient place, care must be taken that it be not bruised nor shaken violently, nor roughly handled, nor carried over any man's shoulders, with the head hanging downwards, nor rolled upon the ground nor over a barrel, nor lifted up by the heels; for experience proves that all those methods may be injurious, and destroy the small remains of life. The unfortunate object should be cautiously conveyed by two or more persons; or in a carriage upon straw, lying as on a bed, with the head a little raised, and kept in as natural and easy a position as possible. The body being dried with a cloth or flannel, should be placed in a moderate degree of heat, but not too near a large fire. The window or door of the room should be left open, and no more persons be admitted into it than those who are absolutely necessary, as the lives of the patients greatly depend upon their having the benefit of pure air. The warmth most promising of success is that of a bed or blanket well heated. Bottles of hot water should be laid at the bottoms of the feet, to the joints of the knees, and under the arm-pits; and a warming-pan mo-

derately heated, or hot bricks wrapped in cloths, should be passed over the body. The natural and kindly warmth of a healthy person lying by the side of the body, has been found in some cases, particularly of children, very efficacious.

Should the accident happen in the neighbourhood of a warm bath, brewhouse, bakehouse, glass-house, or any other place where warm lees, ashes, embers, grains, sand, water, &c. are easily procured, it would be of great importance to place the body in any of these moderated to a degree of heat little exceeding that of a healthy person; or in summer, the exposure to sun-shine has proved beneficial. Friction with the hand, or with warm flannel or coarse cloth, so as not to injure the skin, should also be tried with perseverance for a considerable period of time.

The subject being placed in one or other of those advantageous circumstances as speedily as possible, a bellows should be applied to one nostril whilst the other nostril and the mouth are kept closed, and the lower end of the prominent part of the wind-pipe is pressed backward. The bellows is to be worked in this situation; and when the breast is swelled by it, the bellows should stop, and an assistant should press the belly upwards to force the air out. The bellows should then be applied as before and the belly again to be pressed; this process should be repeated from twenty to thirty times in a minute, so as to imitate natural breathing as nearly as possible. Some volatile spirits heated may be held under the valve of the bellows whilst it works. If a bellows cannot be procured some persons should blow into one of the nostrils whilst

the mouth and other nostril are closed as before. If there be any signs of returning life, such as sighing, gasping, twitching; or any convulsive motions, beating of the heart, the return of the natural colour and warmth, opening a vein in the arm, or external jugular of the neck may prove beneficial, but the quantity of blood taken away should not be large. The throat should be tickled with a feather in order to excite a propensity to vomit, and the nostrils also with a feather, snuff, or any other stimulant, so as to provoke sneezing. A tea-spoonful of warm water may be administered now-and-then, in order to learn whether the power of swallowing be returned, and if it be, a table-spoonful of warm wine, or brandy and water, may be given with advantage; but not before, as the liquor might fall into the lungs before the power of swallowing returns. The other methods should be continued with ardour and perseverance for two hours or upwards, although there should not be the least symptom of life.

Druids, the priests or ministers of religion of the antient Britons, and Gauls. The druids were chosen out of the best families; and were held, both by the honours of their birth, and their office, in the greatest veneration. They are said to have understood astrology, geometry, natural history, politics, and geography: they had the administration of all sacred things; were the interpreters of religion, and the judges of all affairs, indifferently. Whoever refused obedience to them, was declared impious and accursed; they held the immortality of the soul, and the metempsychosis; they are divided by some into several classes, as the vacerri,

bardi, eubagis, semnothii, and saronidæ: they had a chief, or arch-druid, in every nation; he was a sort of high priest, having an absolute authority over the rest, and was succeeded by the most considerable among his survivors. The youth used to be instructed by them, retiring with them to caves and desolate forests, where they were sometimes kept twenty years. They preserved the memory and actions of great men by their verses; but are said to have sacrificed men to Mercury. Cæsar imagined that the druids came from Britain into Gaul, but several among the modern writers are of a different opinion.

From the following *Proclamation for a meeting of the Welsh bards*, at Midsummer 1798, it would appear that the institutions of the druids are not yet wholly extinct:—"In the year 1797, the sun being in Alban Hevin, or the summer solstice, an invitation was given in the hearing of the country and the government, under the period of a year and a day, with protection for all who might seek for privilege and graduation in science and bardism, to repair to the London Meeting, upon Primrose-hill; to the chair of Glamorgan, upon Tyle y Gawl; and to the chair of North Wales, at Caerwys; where there will not be a naked weapon against them; and then and there, in the presence of M. Du, Iolo Morganwg, and B. Glas, and others, bards according to the privilege of the bards of the isle of Britain, to deliver and set forth the judgment of the sessions, in the face of the sun, and in the eye of the light, on all with respect to genius and moral conduct, who may seek for presidency and privilege. And also at the time and places afore-

said, to pronounce on the merits, and to adjudge a prize, for the best translation, into Welsh, of Gray's ode, "The Bard;" and relating to other matters, according to the rights and customs of the bards of the isle of Britain.

"*Ygwyr yn erbyn y byd!*
"The truth, in opposition to the world."

Drum, *tympanum*, is a military musical instrument in form of a cylinder, hollow within, and covered at the two ends with vellum, which is stretched or slackened at pleasure by the means of small cords and sliding knots. It is beat upon with sticks. Some drums are made of brass, but they are commonly of wood. There are several beats of the drum, as assembly, chamade, reveille, retreat, &c. The drum is known to all nations.

Drummer, he that beats the drum, of whom each company of foot has one, and sometimes two. Every regiment has a drum-major, who has the command over the other drums. They are distinguished from the soldiers, by cloaths of a different fashion: their post, when a battalion is drawn up, is on the flanks, and, on a march, it is betwixt the divisions.

Drums, *Kettle*, are two sorts of large basons of copper or brass, rounded in the bottom, and covered with vellum or goat-skin, which is kept fast by a circle of iron, and several holes fastened to the body of the drum, and a like number of screws to screw up and down. They are much used among the horse, as also in operas, oratorios, concerts, &c.

Drunkenness, a well known affection of the brain occasioned by drinking too freely of intoxicating

liquor. Drunkenness appears in different constitutions: some it makes gay, some sullen, and some furious. The mischief of drunkenness consists in the following bad effects. 1. It betrays most constitutions either into extravagances of anger, or sins of lewdness. 2. It disqualifies men for the duties of their station, both by the temporary disorder of their faculties, and at length by a constant incapacity and stupefaction. 3. It is attended with expences, which can often be ill spared. 4. It is sure to occasion uneasiness to the family of the drunkard. 5. It shortens life. To these consequences of drunkenness must be added the peculiar danger and mischief of the example. "Drunkenness" (says Paley) "is a social festive vice. The drinker collects his circle; the circle naturally spreads; of those who are drawn within it, many become the corrupters and centres of sets and circles of their own; every one countenancing, and perhaps emulating the rest, till a whole neighbourhood be infected from the contagion of a single example. With this observation upon the spreading quality of drunkenness may be connected a remark which belongs to the several evil effects above recited. The consequences of a vice, like the symptoms of a disease, though they be all enumerated in the description, seldom all meet in the same subject. In the instance under consideration, the age and temperature of one drunkard may have little to fear from inflammations of lust or anger; the fortune of a second may not be injured by the expence; a third may have no family to be disquieted by his irregularities; and a fourth may possess a constitution fortified against the poison of strong liquors.

But if, as we always ought to do, we comprehend within the consequences of our conduct, the mischief and tendency of the example, the above circumstances, however fortunate for the individual, will be found to vary the guilt of his intemperance less, probably, than he supposes. Although the waste of time and money may be of small importance to you, it may be of the utmost, to some one or other whom your society corrupts. Repeated or long continued excesses which hurt not your health, may be fatal to your companion. Although you have neither wife nor child, nor parent, to lament your absence from home, or expect your return to it with terror; other families, whose husbands and fathers have been invited to share in your ebriety, or encouraged to imitate it, may justly lay their misery or ruin at your door. This will hold good, whether the person seduced, be seduced immediately by you, or the vice be propagated from you to him through several intermediate examples."

With regard to the theory of drunkenness, it may be observed, that the common and immediate effect of wine is to dispose to joy, that is to introduce such degrees of vibrations into the nervous system as are attended with a moderate degree of pleasure. This it seems to do by impressing agreeable sensations on the stomach, which are thence propagated to the brain, continue there, and call up the several associated pleasures that have been formed from pleasant impressions made upon the alimentary duct. The sickness and head-ach which drunkenness occasions the succeeding morning, arise, probably, from the immediate impressions

made on the nerves of the stomach, and from the sympathy which the parts of the head have with the brain, the part principally affected in drunkenness, by deriving their nerves immediately from it.

Drunkenness is punishable by fine and imprisonment, and in law, is no excuse for any crime committed during the paroxysm.

Dryads, *dryades*, in the heathen theology, a sort of deities, or nymphs, which the ancients thought inhabited groves and woods. They differed from the Hamadryades, these latter being attached to some particular tree, with which they were born, and with which they died; whereas the dryades were goddesses of trees and woods in general. Mention is also made of a kind of prophetesses, or witches, among the Gauls, called dryades or druids. See Druids.

Dry-rot is so called by architects in contradistinction only to the more usual circumstances of decay to which wood is liable: such a designation however does not appear the most eligible, as it is now sufficiently ascertained to arise only from moisture. The Dry-rot, as it is called, then consists in a more or less rapid decomposition of the substance of the wood from moisture deposited on it by condensation: to the action of which it is more disposed in certain situations than in others; and this moisture operates more quickly on wood which most abounds with the saccharine, or fermentible principle of the sap. In a work* professedly written on the subject, appears the following remarks; "Several pieces of fir-wood having been promis-

* Randall's Philosophical Enquiry.

cuously thrown together in a moist situation and left there only a few weeks, were, upon being accidentally removed, found in a high state of fermentation, and almost wholly enveloped in a film of white mould, which on further examination appeared to be a complete fungus." This fact appears satisfactory, in as far as it sheweth that where a sufficient degree of humidity takes place, and other things favorable to give the stimuli to the fermentation, the dry-rot is produced.—The pine or fir, of which wood most of our buildings are timbered, is known to contain a considerable portion of saccharine matter, which is easily fermented under favorable circumstances, when the tree is green or newly felled; and not secure from it when more seasoned.—In confined situations, as in the constructions of a building, and when the wood is green, a great degree of fermentation always takes place, and the atmosphere* in this situation not having sufficient power to disperse and neutralise the gases evolved from such a state, they afford a direct pabulum to the fungus plant, which when fecundated; grows and spreads itself over the surface of the wood, walls and every contiguous substance. —Oak-wood is not so soon infected as the fir, nor when it is, is it so rapidly destroyed; which perhaps is the cause why in France so little has been written concerning it, in which country they gene-

* The expedient of letting in air seems to have been particularly attended to by the ingenious architects of our gothic churches, who with that view left various openings in the walls between the two roofs of those edifices.

rally employ it in their buildings; but that it does suffer, as well as other woods, from this rot, there is abundant proof in our own houses when it happens to be employed in them; as well as in our ships: to prevent it in the latter of which, as well as in the former, numerous experiments have been tried with very little or no benefit to the public.—Some buildings have it from the locality of their situations, others from the nature of the material employed, and some from a too rapid finishing. When it takes place from situation, viz. damp-walls near the earth's surface, it is generally if not universally occasioned by the percolation of water from the higher adjoining grounds, which thus intercepted in its current attempts to follow the general hydrostatic law of elevating itself by the syphon line, to a height equal to that from whence it had its origin. Drains made athwart the ascending ground, with very little descent or fall, and made of the depth of one yard for each yard of ascent, and from the foundation, until equal to the height that such damp ever arises, would in most cases prove a prevention for the dry-rot where it originated from extreme moisture. When the cause arises from the state of the material, or from the too rapid finishing, or indeed any other stimulus, the effectual remedy is to char, or carbonise the surface of the wood, which may be easily done in as far as concerns the timbering of a building by exposing it to the operation of fire, and this may be very much facilitated by previously washing the surface with a solution of nitre, and this process would still be more complete, if the wood was slightly wrought or planed.—At a villa in the neighbourhood of Lon-

don, in which this rot had been discovered by protruding itself through the skirting, dado, &c. of the principal rooms; these having been removed as well as the flooring boards, the girders and other timbers were found in a state of decay, so much so that it was deemed expedient to remove the whole, which having been done, the new timber with such of the old as was found fit to be replaced, were all well charred, as also the flooring boards, which being only partially infected, it was not deemed necessary to replace by new ones, and in addition to their being charred they were washed with a solution of the sulphate of iron:—this repair has now been made several years, in a situation too of extreme moisture, and where the dry-rot had been almost an annual visitor, and was effected at much less expence than any previous repair for it, in consequence of much of the old wood having been charred and replaced, which was never done in previous repairs. —Gloster Lodge has since been also repaired for this rot, adopting, as far as its timbering was concerned, the mode of preparing it herein recommended, and if builders in general were to aspire to a praise so heroic as that of disinterestedness, and make use of it for their employers in cases which come under their notice, scenes of decay destructive of some of the best structures the country can boast, would be avoided.—It might be also employed to secure the timbering of our ships; it offers every facility, by the assistance of chemistry, of being accomplished to the slightest material made use of. It is well known that most of the acids possess the power of charring in proportion to the force with which they retain their oxygen. Charcoal has long been

known as indestructible; the antients were acquainted with it, as is obvious from the piles on which the famous Temple of Ephesus was built having been so prepared, nor have there been wanting instances within our own knowledge. This indestructibility given to wood by charring, arises, according to Dr. Bancroft, from its absorption of oxygen, in which state he remarks it will resist the combined action of the sun, air, and moisture for hundreds of years. Dr. Parry also observes "that he had read that charcoal buried in the moist earth had come down to us perfectly sound from the times of the Romans, and that posts long withstood the same moisture, if the part intended to be put into the ground was charred all round to a certain depth. Impressed with these facts, he determined to try an artificial coat of charcoal; and when new water shoots were constructed, he strongly and carefully rubbed them with a coat of drying oil, which he dredged all over with a thick layer of charcoal finely powdered and contained in a muslin bag. After 2 or 3 days when the oil was thoroughly dry, and firmly retained the greatest part of the charcoal, he brushed off what was loose, and over that which adhered a coat of common paint was applied, and in a few days after, a second; the whole became a firm and solid crust, after which the shoots were put into their places, and being examined many years afterwards appeared perfectly sound. He does not think lamp black, which is a pure species of charcoal, would have answered the purpose of forming a thick defensive covering so well as the grosser charcoal which he used; but whatever sort of charcoal is employed, it ought

either to be *fresh made*, or heated *again* in close vessels, so as to expel the water which it greedily attracts from air.—This was an ingenious contrivance by way of experiment, but the shoots might have been charred; but if charcoal put on in this way protects the surface on which it is applied, very beneficial results would be derived in cases of dry-rot by adopting it to all light wainscoting and other wood-work which is fixed to walls, where charring by the common mode might warp and injure it. Dr. Darwin, who was fond of speculating, "supposed that the rot of wood might be entirely prevented by soaking dry-timber first in lime water, till it had absorbed as much of it as may, and then after it is dry by soaking it in a weak solution of vitriolic acid in water; which will unite with the lime already deposited in the pores of the timber, and convert it into gypsum: which he supposes will not only preserve it from decay for many centuries, if it be kept dry, but also render it less inflammable.—He also conceives that beams so impregnated would be less liable to swag, and boards so prepared less liable to warp." In the immense salt mines of Hungary, many large wooden props which support the roof, and are perpetually moistened with salt water trickling down them, are said to have suffered no decay for many centuries.

The reader is referred for a fuller account of this subject to Mr. Randal's "Philosophical Enquiry."

DUCTILITY, a property of certain bodies, whereby

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* Phytologia.

they are capable of being expanded, or stretched forth, by means of a hammer, press, &c. The great ductility of some bodies, especially of gold, is very surprizing: the gold beaters and wire-drawers furnish us with abundant proofs of this property: a single grain of gold may be beat into an extent of several square inches, and yet the leaf remain so compact, as not to transmit the rays of light, and Dr. Halley found that a small cube of gold, whose side is the 1-100th part of an inch only, contains 2,433,000 visible parts. M. Reaumur shews that in the common way of drawing gold-wire, a cylinder of silver 22 inches long and $1\frac{1}{2}$ inch in diameter is stretched to 1,163,520 feet, or is 634,692 times longer than before, which amounts to about 97 leagues. To wind this thread on silk for use, they first flatten it, in doing which, it stretches one-fourth more, so that the twenty-two inches are now extended to about 120 leagues in length. Glass is also very ductile, and may be spun out into exceedingly fine threads. Our ordinary spinners do not form their threads of silk, flax, &c. with half the expedition as the glass-spinners do threads of this brittle matter. The method of performing this is as follows: There are two workmen employed; the first holds one end of a piece of glass over the flame of a lamp, and when the heat has softened it, a second operator applies a glass hook to the metal thus in fusion, and, withdrawing the hook again, it brings with it a thread of glass, which still adheres to the mass, then fitting his hook on the circumference of a wheel about 30 inches in diameter; he turns the wheel as fast

as he pleases; which drawing out the thread, winds it on its run, till it is covered with a skein of glass-thread. The mass in fusion over the lamp, diminishes insensibly, being wound out like a clue of silk upon the wheel; and the parts as they recede from the flame, cooling, become more coherent to those next to them, and this by degrees: the parts nearest the fire are always the least coherent, and of consequence must give way to the effort that the rest make to draw them towards the wheel. It is said that the flexibility of glass increases in proportion to the fineness of the thread, and that, probably, had we but the art of drawing threads as fine as a spider's web, we might weave stuffs and cloths of them for wear.

Duel, a single combat, at a time and place appointed, in consequence of a challenge. This custom came originally from the northern nations, among whom it was usual to decide all their controversies by arms. Both the accuser and accused gave pledges to the judges on their respective behalves; and the custom prevailed to far among the Germans, Danes, and Franks, that none were excused from it but women, sick people, cripples, and such as were under twenty-one years of age, or above sixty. Even ecclesiastics, priests, and monks were obliged to find champions to fight in their stead. The punishment of the vanquished was either death, by hanging or beheading; or, mutilation of the members, according to the circumstances of the case. Duels were at first admitted, not only on criminal occasions, but on some civil ones for the maintenance of rights to estates, and

the like: in latter times, however, before they were intirely abolished, they were restrained to these four cases: 1. That the crime should be capital. 2. That it should be certain the crime was perpetrated. 3. The accused must, by common fame, be supposed guilty. And 4. The matter not capable of proof by witnesses. In England, though the trial of duel is disused, the law on which it is founded is still in force. Duel at present, is used for a single combat on some private quarrel, and must be premeditated, otherwise it is called a rencountre. If a person be killed in a duel, both the principals and seconds are guilty of murder, whether the seconds engage or not. It is also a very high offence to challenge a person, either by word or letter, or to be the messenger of a challenge. The severe edicts made by Lewis XIV. against duels, did in a great measure put a stop to the custom in France.

Duke is either the title of a sovereign prince, as the duke of Savoy, Parma, &c. the grand duke of Tuscany, Muscovy, &c. or it is the title of honour and nobility next below princes. The commanders of armies in time of war, the governors of provinces, and wardens of marches, in time of peace, were called *duces*, under the latter emperors. The Goths and Vandals divided all Gaul into dutchies and counties, the governors of which they sometimes call *duces*, and sometimes *comites*. In France, under the second race of kings, though they retained the name and form of ducal government, there were scarcely any dukes except those of Burgundy, Aquitain, and France. In England, among the Saxons, the commanders of armies, &c. were

called dukes, *duces* without any addition, till Edward III. made his son, the black prince, duke of Cornwall; after whom there were more made in the same manner, the title descending to their posterity. Duke, then, at present, is a mere title of dignity without giving any domain, territory, or jurisdiction over the place from whence the title is taken. A duke is created by patent, cincture of sword, mantle of state, imposition of a cap and coronet of gold on his head, and a verge of gold put into his hand. His title is Grace; and, in the style of the heralds, Most noble prince.

Dumbness, the privation of the faculty of speech. The most general or rather the sole cause of dumbness is the want of the sense of hearing. The use of language is originally acquired by imitating articulate sounds. From this source of intelligence deaf people are entirely excluded; they cannot acquire articulate sounds by the ear: unless, therefore, articulation be communicated to them by some other medium, these unhappy people must for ever be deprived of the use of language; and as language is the principal source of knowledge, whoever has the misfortune to want the sense of hearing must remain in a state little superior to that of the brute creation. See Deafness.

Dunkers, or *tunkers*, a sect of Christians peculiar to America, which arose about the year 1724, and formed a kind of commonwealth, the principal seat of which is Pennsylvania. The dunkers baptize by immersion; dress like dominican friars; never shave their heads or beards; have different apart-

ments for the two sexes; subsist chiefly on vegetables, indulging in mutton only at love-feasts; allow themselves no bed, unless in sickness, using, in their separate cells, benches to lie upon, and blocks of wood for pillows. Their principal idea of discipline is the mortification of the body; and doctrinal tenet, the denial of the eternity of punishment. Their common appellation, *harmless dunkers*, conveys an idea of their character in one word.

Duodecimals, in arithmetic, are numbers proceeding in a proportion of twelves; in the same way as decimals proceed in a proportion of tens. This way of conceiving an unit divided is chiefly in use among artificers, who generally take linear dimensions of their work in feet, inches, and twelfth parts of an inch. In squaring their dimensions, duodecimals are multiplied into duodecimals, and the operation is called "cross-multiplication:" Rule. Under the multiplicand write the corresponding denominations of the multiplier: multiply each term in the multiplicand, beginning at the lowest, by the feet in the multiplier, and write the result of each under its respective term, observing to carry an unit for every twelve, from each lower denomination to its next superior. In the same manner, multiply all the multiplicand by the prime in the multiplier, and set the result of each term one place removed to the right hand of those in the multiplicand. Do the same with the seconds in the multiplier, setting the result of each term two places removed to the right hand of those in the multiplicand. Proceed in like manner with all the rest of the denominations, and their sum, when

added together, gives the answer: the following example will illustrate the rule;

| | ft. | in. | ″ | | ft. | in. | ″ |
|---|---|---|---|---|---|---|---|
| Ex. multiply | 9 | 9 | 4 | by | 3 | 4 | 3 |
| | 3 | 4 | 3 | | | | |
| | 29 | 4 | 0 | | | | |
| | 3 | 3 | 1 | 4‴ | | | |
| | | 2 | 5 | 4 | 0⁗ | | |
| Answ. | 32 | 9 | 6 | 8 | 0 | Feet. | |

Dyeing, the art of giving a lasting colour to silks, cloths, and other substances, whereby their beauty is much improved, and value enhanced. This art depends chiefly on three things, viz. 1. Disposing the surface of the stuffs to receive and retain the colours; which is performed by washing them in different leys, digesting, beating, &c.; by means of which the viscous gluten of the silk-worms naturally adhering to their threads, is washed and cleansed from them, and thus they become fitted gradually to imbibe the colours. By these also the greasy foulness adhering to wool and flax is scoured off. See Cloth. 2. So to grind the colours, as that they may enter the body duly prepared, and preserve their brightness undiminished. 3. The third consists in having beautiful colours.

Dyeing properly so called is a chemical process; and in order that it may succeed, it is necessary that the colouring matters should be dissolved in some fluid, and that their attraction to that fluid should be less than that to the stuff. The

stuff receives the dye better in proportion to the degree of affinity which the colouring matter has to it, and to the solvent relatively, for if the attraction to the stuff is much more than to the solvent, the stuff receives the dye too rapidly; if on the other hand its attraction to the solvent is too great, the stuff will either not take the dye at all, or it will take it very slowly and faintly. Wool has a stronger attraction for colouring matters than silk, silk than cotton, and this latter a stronger than linen. The essential circumstances in dyeing are to ascertain the affinities of the colouring substance; first, to the solvents; secondly, to those substances which modify its colour, increase its brilliancy, and strengthen its union with stuff; thirdly to the different agents which may change the colour, and principally to air and light. In dyeing the title of Mordant is applied to those substances which serve as intermedia between the colouring particles and the stuff to be dyed, either for the purpose of facilitating, or of modifying their combination, and by their means colours are varied, brightened, made to strike, and rendered more durable. If a sufficient number of colouring matters could be procured which had an affinity to cloth sufficient to answer all the purposes of dyeing, the art would be exceedingly simple and easy. But except indigo there is scarcely a dye-stuff which yields of itself a good colour sufficiently permanent to deserve the name of a dye. This difficulty is obviated by employing an intermediate substance, which has a strong affinity both for the stuff and the colouring matter, and this is the chief purpose

for which the mordant is used. The principal substances employed as mordants are aluminous salts, lime, metallic oxydes, some astringent substances, and animal matters. The three simple colours in dyeing are red, yellow, and blue; all other colours are compounded of these. Different shades or tints of the same colour are produced by using different drugs, or by varying the quantity of colouring particles, or in the case of compound colours, by varying the proportion of the different simple ones, of which they are composed.

*Reds* are produced by cochineal, kermes, and gum lac among the animal productions: and madder, archil carthamus and Brazil-wood among the vegetable.

*Yellows* are produced by vegetable substances only, as weld, fustic, arnotta, quercitron bark and sumack.

The principal *blues* are from indigo, wood, log-wood and Prussian blue.

The principal compound colours are produced by mixing the simple in the dyeing liquor, or by dyeing the stuff first in a bath of one simple colour, then in that of another.

Dynamics signify properly the science of moving forces; but mathematicians, by this term, understand the science of the motion of such bodies as impel one another.

Dynasty, among historians, signifies a race or succession of kings of the same line or family: such were the dynasties of Egypt.

## E.

E, the fifth letter in the alphabet, and the second vowel, has different pronunciations in most languages. The Greeks have their η and ε, or long and short *e*. The French have their *e* open, *e* masculine, and *e* feminine or mute. In English there are three kinds of *e*, open or long, as in *wear*, *bear*; short, as in *wet*, *kept*, and mute as in *love*, *came*, &c. As a numeral, E stands for 250. In Sea-charts E stands for East: E by N. and E by S. East by North, and East by South.

Eagle. See Falco.

Eagle, in heraldry, the eagle is accounted one of the most noble bearings in armoury, and, according to the learned in this science, ought to be given to none but such as greatly excel in the virtues of generosity and courage, or for having done singular services to their sovereigns.

Among the ancients, the eagle was held sacred to Jupiter, and on that account placed on his sceptre. It is well known that the Romans had the greatest veneration for it, looking upon it as the talisman of their state, and taking it for their principal ensign. It was either of gold or silver, borne singly on the point of a pike, till the time of Constantine, when the empire being divided into the eastern and western, the eagle was afterwards represented with two heads.

Eagle, *Black*, an order of knighthood, instituted by the elector of Brandenburgh, in 1701, on his

being crowned king of Prussia. The knights of this order wear an orange-coloured ribband, suspending a black eagle.

Eagle, *White*, a similar order in Poland, instituted in 1325, by Uladislaus V. on occasion of the marriage of his son Casimir to the daughter of the great duke of Lithuania. The knights of this order wear a chain of gold suspending a silver eagle, crowned.

Eaglet, a diminutive of eagle, properly signifying a young eagle. In heraldry, when there are several eagles on the same escutcheon, they are termed eaglets.

Ear, in anatomy, the organ of hearing. A very delicate and fine membrane carried along through the cavities of the labyrinth, is formed of an expansion of the auditory nerve, and is the primary part of the organ of hearing, as the retina is formed of the expansion of the optic nerve, and is the primary organ of seeing.

Ear-pick, an instrument of ivory, silver, or other metal, somewhat in form of a probe, for cleaning the ear. The Chinese have a variety of these instruments, with which they are very fond of tickling their ears; but this practice, as Sir Hans Sloane judiciously observes, must be prejudicial to so delicate an organ, by bringing too great a flow of humours on it.

Earl, a British title of nobility, next below a marquis, and above a viscount. Earls were anciently called comites, because they were wont *comitari regem*, to wait upon the king for council and advice. The Germans call them *graves*, as landgrave, mar-

grave, palsgrave, rheingrave; the Saxons ealdormen, unless that title might be more properly applied to our dukes; the Danes, eorlas; and the English, earls. The title, originally, died with the man. William the conqueror first made it hereditary, giving it in fee to his nobles, and allotting them for the support of their state the third penny out of the sheriff's court, issuing out of all pleas of the shire whence they had their title. At present, an earl is created by cincture of sword, mantle of state put upon him by the king himself, a cap and coronet put upon his head, and a charter in his hand. The title is accompanied by no territory, private or judicial rights, but confers nobility, and an hereditary seat in the highest assembly in the nation.

Earl *marshal of England*, is a great officer who had anciently several courts under his jurisdiction, as the court of chivalry, and the court of honour. Under him is also the herald's office, or college of arms. He has some pre-eminence in the court of marshalsea, where he may sit in judgment against those who offend within the verge of the king's court. This office is of great antiquity in England, and anciently of greater power than now; and has been for several ages hereditary in the noble family of Howard.

Earth, in astronomy and geography, one of the primary planets, being this terraqueous globe whereon we inhabit.

The *figure of the Earth* was accounted by some of the ancients to be like that of an oblong cylinder; by others, of the form of a drum, and by others

flat. The moderns demonstrate it to be nearly spherical from the following, among other considerations. 1. All the appearances of the heavens, both at land and at sea, are the same as they would be if the earth were a globe. 2. In eclipses of the moon, which are caused by the shadow of the earth falling upon the moon, this shadow is always circular; and a body can be no other than a globe, which in all situations casts a circular shadow. 3. Several navigators have sailed quite round the globe, steering their course directly south and west till they came to the Magellanic sea, and thence to the north and west, till they returned to their port from the east; and all the phenomena which should naturally arise from the earth's rotundity, happened to them. Besides, their method of sailing was also founded upon this hypothesis, which could never have succeeded so happily, if the earth had been of any other figure. It is true, the surface of the earth is not an exact geometrical globe; but the inequalities are so inconsiderable, that the highest mountain bears no greater proportion to the bulk of the earth, than a grain of dust does to a common globe. The figure of the earth, then, was reckoned by mathematicians and geographers as perfectly spherical, excepting the small inequalities on its surface, of mountains and vallies; till an accident engaged the attention of sir Isaac Newton, and M. Huygens, who demonstrated from the laws of hydrostatics, and the revolution of the earth about its axis, that its figure was not a true sphere, but an oblate spheroid flatted towards the poles. Not only the figure of the earth has been

ascertained, but its magnitude, and it is found that ts diameter is equal to 7,958 miles in length. Circumference 25,000. Superficies 198,944,206 square miles. Solidity 26,393,000,000 cubic miles. It is also imagined that the unexplored portions of the earth and seas contain 160,522,026 square miles, the inhabited part of the earth is equal to 38,422,180, in the following proportions,

| | |
|---|---|
| Europe - - - - - | 4,456,065 |
| Asia - - - - - - | 10,968,423 |
| Africa - - - - - | 9,654,817 |
| America - - - - - | 14,142,875 |

"Motion of the Earth." The earth has a triple motion. 1. A diurnal motion round its own axis, from west to east, in twenty-four hours, which occasions the perpetual succession of days and nights. 2. An annual motion round the sun in a year, which produces the different seasons, and the lengthening and shortening of days. 3. That motion by which the poles of the world revolve about the poles of the ecliptic, and occasion what is commonly called the precession of the equinoxes, or more properly, the retrogression of the earth's nodes.

*Earth*, in gardening and husbandry, if good, should be of a blackish colour, gravelly, fat, pliant, or easy to be digged; it should neither be cold nor light, it ought to have no ill smell or taste, and it should be of the same quality three or four feet deep for trees, which, if they have not that depth, will languish and decay after they have been planted five or six years. Fruit trees will thrive in a less depth, and they generally produce the

most generous fruits, when their roots spread near the surface of the earth. Husbandmen call that new earth which, lying three or more feet deep, never served to the nourishment of any plant; or earth that has been a long time built upon, though it had formerly bore; earth likewise of a sandy loamy nature, where cattle have been a long time fed, may be accounted such, and be of excellent use for most sorts of plants, especially if it has been thrown up in heaps to grow richer.

Earthquake, in natural history, a violent agitation or trembling of some considerable part of the earth, generally attended with a terrible noise like thunder, and sometimes with an eruption of fire, water, wind, &c. Earthquakes and volcanoes are both produced from the same cause, which may be thus explained: those countries which yield great store of sulphur and nitre, or where sulphur is sublimed from the pyrites, are by far the most injured and incommoded by earthquakes; for where there are such mines, they must send up exhalations, which meeting with subterraneous caverns, must adhere to the arches of them, as soot does to the sides of our chimnies; where they mix themselves with the nitre or saltpetre which comes out of these arches (in like manner as we see it come out of the inside of the arch of a bridge) and so make a kind of crust which will very easily take fire. There are several ways by which this crust may take fire, viz. 1. By the inflammable breath of the pyrites, which is a kind of sulphur that naturally takes fire of itself. 2. By a fermentation of vapours to a degree of heat, equal to that of fire

and flame. 3. By the falling of some great stone which is undermined by water, and striking against another, produces some sparks that set fire to the neighbouring combustible matter, which being a kind of natural gunpowder, at the appulse of the fire goes off with a sudden blast or violent explosion, rumbling in the bowels of the earth, and lifting up the ground above it, so as sometimes to make terrible havoc and devastation, till it gets vent or a discharge. Burning mountains and volcanoes are only so many spiracles serving for the discharge of this subterranean fire, when it is thus assembled; and where there happens to be such a structure and conformation of the interior parts of the earth, that the fire may pass freely and without impediment from the caverns therein, it gathers into these spiracles, and then readily and easily gets out from time to time without shaking or disturbing the earth: but where a communication is wanting, or the passages are not sufficiently large and open, so that it cannot come at these spiracles, without first forcing and removing all obstacles, it heaves up and shocks the earth, till it hath made its way to the mouth of the volcano; where it rushes forth, sometimes in vast flames, with great velocity, and a loud bellowing noise.

Earthquakes are sometimes confined to a narrow space, which is properly the effect of the re-action of the fire; and they shake the earth just as the explosion of a powder-magazine causes a sensible concussion at the distance of several leagues. Thus a violent eruption of Ætna, will cause an earthquake over all the island of Sicily; but it will

never extend to the distance of three or four hundred leagues. In like manner, when some new vents of fire have been formed in mount Vesuvius, there are felt at the same time earthquakes at Naples, and in the neighbourhood of the volcano; but these concussions have never shaken the Alps, nor been communicated to France, or other countries remote from Vesuvius. Sometimes they are felt at considerable distances, and shake a long tract of ground without any interruption or volcano appearing. There are instances of earthquakes which were felt at the same time in England, France, Germany, and Hungary, and these always extend a great deal more in length than in breadth: the earthquake, on the 1st of Nov. 1755, which destroyed Lisbon, extended from north to south 2500 miles with the utmost violence; it appears to have begun in Greenland, and passing southward was felt in the islands of Trinity, Ferro, some of the western isles of Scotland, in Ireland, in the south-west part of England, &c. and passing under the ocean shook all Portugal and great part of Spain, whence it passed to the continent of Africa with incredible violence, and having terrified the kingdoms of Fez and Morocco, probably vented itself in the southern ocean. Earthquakes shake a tract of ground with more or less violence in different places, in proportion as it is remote from the fire; and they are almost always accompanied with a dull noise like that of a heavy carriage rolling along with great rapidity.

Earths, in chemistry. The word *earth*, in common language, has two meanings; it sometimes

signifies the *globe* that we inhabit, in which sense it has been illustrated in the preceding articles, and sometimes the *mould* in which vegetables grow. This mould has been analysed by chemists, and found to consist of a variety of substances, without order or regularity. The larger portion, however, of its materials, are a number of small bodies, having several properties, in the possession of which they resemble each other; and these are classed together, and denominated earths.

Every body, then, that has the following properties, is an earth:

1. Insolubility in water; at least when combined with carbonic acid. 2. Little or no taste or smell; at least when combined with carbonic acid. 3. Incombustibility; and incapability, while pure, of being altered by fire. 4. A specific gravity not exceeding 4.9. 5. Capability of assuming, when pure, the form of a white powder.

The earths at present known are eight in number: 1. lime, 2. magnesia, 3. barytes, 4. strontites, 5. alumina, 6. silica, 7. jargonia, 8. glucina.

The characteristics above recited are not, perhaps, rigorously applicable to each of the species; but these bodies are similar in a number of properties, sufficient to render their classification under one head convenient.

1. Lime is found in every part of the world. It is discovered in its purest state in limestone, marbles, and chalk: none of these substances are strictly speaking, lime; but they are all capable of becoming lime by a well-known process, by keeping them for some time in a white heat: this pro-

cess is called *the burning of lime;* the product is denominated quicklime: this last substance is what is called *lime.*

2. Magnesia was first known in the beginning of the eighteenth century, when a Roman canon offered it, under the name of *magnesia-alba*, as a cure for all diseases. It is procured in the following manner: sea-water, and the water of many springs similar to those of Epsom, contain a salt called sulphat of magnesia, and composed of the earth in question and sulphuric acid. This salt is dissolved in water, and half its weight of potass added. The magnesia is immediately precipitated; because potass has a stronger *affinity* for the sulphuric acid: it is then to be washed with a sufficient quantity of water, and dried.

3. Barytes is an earth contained in a very heavy mineral found in Sweden, Germany, and Britain.

4. Strontites, an earth contained in the Strontian mineral, which has been found in Argyleshire, and near Bristol, in England; in Pensylvania in the United States; and in France and Sicily; and is of a white colour.

5. If one part of powdered flints or sand, mixed with three parts of potass, be put into a crucible, and kept in a melted state for half a hour, a brittle substance is produced which may be dissolved in water; and, an acid being poured into the solution, which is called *liquor silicum*, or liquor of flints, a white, spongy substance is precipitated: this substance, which, when dry, is a soft white powder, without either taste or smell, is called *siliceous earth*, or *silica.*

6. Alumina is an earth obtained from alum, dissolved in hot water.

7. Jargonia, contained in a precious stone, called the *jargon* or *zircon*.

8. Glucina, an earth discovered by M. Vauguelin in the *beryl*.

The first four of these earths are sometimes called *alkaline earths*. See VOLTAISM, under which article will be given some account of the decomposition of several of these earths.

EASTER, a festival of the Christian church, observed in memory of our Saviour's resurrection. The Greeks and Latins call it *pascha;* an Hebrew word signifying *passage*, applied to the Jewish feast of the passover, to which the Christian festival of Easter corresponds. It is called Easter in the English, from the goddess Eostre, worshipped by the Saxons with peculiar ceremonies in the month of April.

It is appointed by our rubric that Easter shall be celebrated upon the first Sunday after the first full moon immediately following the 21st of March. It requires some calculation to find the true time of Easter, unless we first know when the full moon happens: to save this trouble we shall give a table by which it will easily be found.

By the following Table, Easter-Sunday may be found for any year during the present century, by knowing the GOLDEN NUMBER and DOMINICAL LETTER, which see.

| Golden Number | Paschal Moon | Sunday Letter |
|---|---|---|
| 14 | MARCH 21 | C |
| 3 | 22 | D |
| | 23 | E |
| 11 | 24 | F |
| | 25 | G |
| 19 | 26 | A |
| 8 | 27 | B |
| | 28 | C |
| 16 | 29 | D |
| 5 | 30 | E |
| | 31 | F |
| 13 | APRIL 1 | G |
| 2 | 2 | A |
| | 3 | B |
| 10 | 4 | C |
| | 5 | D |
| 18 | 6 | E |
| 7 | 7 | F |
| | 8 | G |
| 15 | 9 | A |
| 4 | 10 | B |
| | 11 | C |
| 12 | 12 | D |
| 1 | 13 | E |
| | 14 | F |
| 9 | 15 | G |
| | 16 | A |
| 17 | 17 | B |
| 6 | 18 | C |

The use of this table is as follows: Look for the golden number of the year in the first column, against which stands the day of the paschal full moon; then look in the third column for the dominical letter, next after the day of the full moon, and the day of the month standing against that letter is Easter-Sunday. When the full moon happens on a Sunday, then the following Sunday is Easter-day.

Examples. In 1811, the golden number is seven, against which is April 7th, and the dominical letter being F, (the letter which is opposite to the 7th of April) Easter-day will be the Sunday after, or the 14th of April.

Eastland *company*, a company of merchants incorporated in the 21st of the reign of queen Elizabeth, and impowered to trade to all places within the Sound, except Narva, the only Russian port at that time in the Baltic. This company is at present inconsiderable, the trade to Norway and Sweden having been laid open to private merchants, by act of parliament.

East-India *company*, a company of merchants trading to the East Indies, and Canton, Amoy, and Chusan, ports of China, incorporated about the 42d of queen Elizabeth, A. D. 1600, and impowered to trade to countries to the eastward of the Cape of Good Hope, exclusive of all others. About the year 1698, application being made to parliament by private merchants, for laying this trade open, an act passed impowering every subject of England, upon raising a sum of money, for the supply of the government, to trade to those parts. A great subscription was accordingly raised, and the subscribers were styled the New East-India Company; but

the old establishment being in possession of all the forts on the coast of India, the new one found it its interest to unite; and both, trading with one joint stock, have ever since been known under one name, viz. *The United East India Company.*

In the age of Nero, the East India trade was carried on by the river Nile; the merchandize proceeded in caravans to the Red Sea, where it was embarked for the Indian Ocean. The specie annually carried from Rome, upon this account, amounted, according to Pliny's computation, to about 300,000*l.* sterling; and the usual returns, which arrived in December and January, yielded, in clear gain, an hundred for one.

EBONY, the wood of a tree supposed to be of the palm kind, which is imported from different countries of the East and West Indies. This wood is extremely solid, and capable of a fine polish; and, therefore, much used in toys and marquetry.

ECHO, a sound reverberated or reflected to the ear from some solid body. As the undulatory motion of the air, which constitutes sound, is propagated in all directions from the sounding body, it will frequently happen that the air, in performing its vibrations, will impinge against various objects, which will reflect it back, and so cause new vibrations the contrary way: now if the objects are so situated as to reflect a sufficient number of such vibrations as proceed different ways to the same place, the sound will be there repeated, and is called an echo; and the greater the distance of the object is, the longer will be the time before the repetition is heard: and when the sound, in its progress, meets with objects at different distances, sufficient to pro-

duce an echo, the same sound will be repeated several times successively, according to the different distances of these objects from the sounding body, which makes what is called a repeated echo. See Acoustics.

Eclectics, ancient philosophers, who, without attaching themselves to any particular sect, selected whatever appeared to them the best and most rational from each.

Eclipse, in astronomy, the deprivation of the light of the sun, or of some heavenly body, by the interposition of another heavenly body between our sight and it. A total eclipse of the sun or moon is when their whole bodies are obscured; and a partial one is when part only of their bodies is darkened: a central eclipse is when it is not only total, but the eclipsed body passes through the centre of the shadow. In explanation of eclipses, the mind must figure to itself the body of the sun, irradiating the earth on one side of its globe, which, being a solid body, intercepts the rays, and therefore projects a long shadow from its opposite side: now, when the moon happens to come in a line with this shadow, it falls upon her, and she is eclipsed. If she is in a direct line with the earth, she is wholly overshadowed, that is, suffers a total eclipse; but if she be in some degree without this direct line, on either side, then there only ensues a partial eclipse, her whole orb not being, in this case, at any period of the eclipse, obscured.

An eclipse of the sun happens when the moon passes between the earth and that body, and thus intercepts his rays. In this case, an inhabitant of

the moon would observe a partial *eclipse of the earth.*

An eclipse of the sun never happens but at a new moon; nor one of the moon but when she is at her full.

Ecliptic, in astronomy, a great circle of the sphere, supposed to be drawn through the middle of the zodiac; or, more strictly speaking, that path or way among the fixed stars, that the earth appears to describe, to an eye placed in the sun. It is called ecliptic, by reason that all eclipses happen when the planets are in or near its nodes.

Ecliptic, in geography, a great circle on the terrestrial globe, not only answering to, but falling within the plane of the celestial ecliptic.

Eclogue, in poetry, a kind of pastoral composition, or a small elegant poem, in a natural simple style.

Economy, *political*, is the science which treats of the wealth of nations. Its object is first to ascertain in what wealth consists, and then to explain the causes of its production, and the principles on which it is distributed.

Effervescence, in chemistry, is a rapid disengagement of gas taking place within a liquid; in consequence of this numerous bubbles rise to the surface, forming a head of froth, and bursting with a hissing noise.

Effluvium, a term used to express the minute particles which exhale from most, if not all, terrestrial bodies in the form of insensible vapours.

Egg, a body containing an embryo, or germ of an animal, under a cortical surface, or shell. The exterior part of an egg is the shell, a thin, earthy,

and brittle cortex, including all the other parts. The shell becomes more brittle by being exposed to a dry heat. It is lined every where with a very thin but pretty tough membrane, which dividing at, or very near, the obtuse end of the egg, forms a small bag, where only air is contained. In new-laid eggs this follicus appears very little, but becomes larger when the egg is kept. Within this are contained the albumen, or white, and the vitellus, or yolk; each of which have their different virtues. See *Albumen* and *Vitellus*. The animal in the egg is first nourished by the albumen; and, when this is consumed, by the vitellus, as with milk.

Egypt, a country of Africa, bounded on the north by the Mediterranean, on the east by the Red Sea, and the Isthmus of Suez, on the south by mountains, which separate it from Nubia, and on the west by the deserts of Lybia. It is reckoned about 500 miles long and 160 broad, and is divided into Upper and Lower Egypt, the former extending in a long narrow valley from Syene to Grand Cairo. Two ridges of mountains form the outlines of Upper Egypt, running along each side of the Nile, till, reaching Grand Cairo, the western ridge takes its course towards Alexandria, the other towards the Red Sea. Lower Egypt includes all the country between Cairo and the Mediterranean on the north and south; and Lybia and the Isthmus of Suez to the west and east, bounded by sandy deserts; it contains slips of land fertile and well cultivated on the borders of the rivers and canals, and, in the centre, that tract of land which is called the Delta, formed by the branches of the Nile.

By some geographers, Egypt is divided into three parts, Upper, Middle and Lower: the Upper was called Thebais, now Said: Middle Egypt, now called Vostani, and Lower Egypt, the best part of which was the Delta, now called Bahira. The Thebais took its name from Thebes, the capital, and once contained many more cities; the other parts of Egypt contained a great number of magnificent and populous cities. Egypt is famed for its great fertility, which is ascribed to the overflowing of the Nile. This river begins to rise when the sun is vertical in Ethiopia, and the annual rain falls there from the middle of May to September, or even October. At the height of its flood in the Lower Egypt, nothing is to be seen in the plains but the tops of forests and fruit-trees, their towns and villages being built upon eminences, either natural or artificial.

EGYPTIANS, see *Gypsies*.

ELASTICITY, or *elastic force*, that property of bodies whereby they restore themselves to their former figure, after any external pressure; being the same with what is otherwise called springiness, very observable in a bent bow, steel springs, and the like. A perfectly elastic body, is that which restores itself with the same force wherewith it was bent, or depressed; those which do not restore themselves with exactly the same force, being called imperfectly elastic bodies. Philosophers account for elasticity from the principles of the attraction and repulsion of bodies: thus, if a steel spring, wire, or piece of very thin glass, be bent out of its natural position, the particles on the convex part are forced from the intimate union they had before;

and, on the concave part, they are forced nearer together, or harder upon each other, than in the natural state: in both which cases, there will be a considerable resistance to overcome, and consequently require a superior force. During this state of the particles, they may be said to be under a sort of tension on one side, and compression on the other: and, since by this force they are not drawn out of each other's attraction, as soon as the force is remitted or ceases to act, the attractive power reduces the particles, and unbends the wire. Now it is well known, that many substances are composed of such fibrous parts or filaments which resemble fine wires, and are interwoven and disposed in such a manner, as in sponge, for instance, that they cannot be compressed without being bent or wrested from their natural position; whence all such bodies will, in such cases, exert a spring or force to restore themselves, in the same manner that the bent wire did. All known bodies are in some degree or other elastic, but none of them perfectly so; such are most metals, semi-metals, stones, and animal and vegetable substances, however they may differ in degree. Elasticity seems to vary, according to the different densities of bodies; for the more metals are hammered, the more elastic they become.

Elder, or *seniors*, in Jewish history, were persons the most considerable for age, experience, and wisdom. Of this sort were the seventy men whom Moses associated to himself in the government of his people; such, likewise, afterwards, were those who held the first rank in the synagogue, as presidents. In the first assemblies of the primitive

Christians, those who held the first place, were called elders. The word presbyter, often used in the New-Testament, is of the same signification: hence the first councils of the Christians were called presbyteria, or councils of elders.

Elder is also a denomination still preserved in the presbyterian discipline. They are officers who, with the ministers and deacons, compose the sessions of the kirk. The elder's office is to assist the minister in visiting the congregation upon occasion, to watch over the morals of the people of his district, and to give them private reproof in case of any disorder; but if the scandal be gross, or the person obstinate, to lay the thing before the session. The elders are chosen from among the most substantial, intelligent, and regular people, by the session or consistory of the kirk.

Elect, in matters of polity, is applied to archbishops, and other ecclesiastic officers, who are chosen, but not yet consecrated; as also to secular officers before they are invested with their office or jurisdiction: thus the emperor is said to be elect, before he is inaugurated; and the lord mayor of London, before his predecessor's mayoralty is expired.

Elector, a person who has a right to elect or choose another to an office, honour, &c. Elector is particularly, and by way of eminence, applied to those princes of Germany in whom lies the right of electing the emperor; being all sovereign princes, and the principal members of the empire. In 1356, Charles IV, by the golden bull, fixed the number of electors to seven; three ecclesiastics, *viz.* the archbishops of Mentz, Treves, and Cologne; and four

seculars, *viz.* the king of Bohemia, count Palatine of the Rhine, duke of Saxony, and marquis of Brandenburg. In 1648, this order was changed, the duke of Bavaria being put in the place of the count Palatine, who, having accepted the crown of Bohemia, was outlawed by the emperor; but being at length restored, an eighth electorate was created for the duke of Bavaria. In 1692, a ninth electorate was created, by the emperor Leopold, in favour of the duke of Hanover, of the house of Brunswick-Lunenburg.

Electricity, the operation of a fluid, extremely subtile and in general invisible; but which is sometimes the object of the senses, and discovers itself to be one of the principal agents in nature.

The name is derived from *electrum*, amber, a substance the attractive power of which was observed at least six hundred years before the Christian era: electricity, however, scarcely became a distinct object in science before the commencement of the seventeenth century, when a book, containing accounts of several electrical experiments, was written by Dr. William Gilbert; and it is only since the year 1745, when the *Leyden* phial was discovered, that it has advanced with any considerable rapidity. The theory is still a matter of doubt and controversy, or rather, one concerning which no one presumes to speak decidedly: to describe electricity, therefore, it is necessary to relate a vast variety of facts: an undertaking too voluminous for this work, wherein it shall only be attempted to prepare the reader for whatever he may meet with on the subject, by defining the technical terms.—Electrics are non-conductors; and con-

ductors non-electrics. An electrician divides all substances into two classes: 1. *Non-conductors*, or those electrical by themselves, as glass, amber, sealing-wax, &c. which are sometimes called *electrics per se*; 2. *Non-electrics*, or those which though incapable of being *excited*, can yet, in certain circumstances, convey the electric power from one body to another: these are also called *conductors*; the most perfect of which are metals, charcoal, and water.

The effects of the electric fluid, whether by attraction or repulsion, or by emitting streams, or pencils as they are called, of blue light, are all classed under the general word *electricity*; and any body to which that power of attraction, repulsion, &c. is communicated, is said to be electrified: if its virtue is inherent in itself, it is said to be *excited*.

If you take a clean and dry glass tube, and rub it up and down several times with a dry and rather warm piece of flannel, the tube will be excited, and will, if presented to any small light substances, attract and repel them alternately.

If the tube be excited in the dark, and the knuckle be presented to it, a spark will be seen passing between the finger and the tube, accompanied by a snapping noise, and the sensation of pain. The noise and sensation in this experiment, and the attraction and repulsion in the other, are electrical effects.

Electrics, as has been observed, are also called non-conductors; a name which they have obtained from their power of stopping the communication of the electric virtue from one body to another:

thus, though a *conductor* be properly placed for receiving the virtue from an excited electric, none will pass to it, if any *electric* substance be interposed; or if the *conductor* be terminated by an electric, none will pass beyond the place where the electric substance begins.

Insulation, is a term used when a *conducting* or non-electric substance is placed upon an electric, so that any power communicated to it cannot pass off. Respecting electrics and non-electrics, it is however necessary to observe that the definitions must be understood with some degree of limitation; for there is no substance either a perfect electric, or a perfect conductor: the most complete conductors making, when they are of great length, a sensible resistance to the passage of the fluid through them; and the most complete electrics being in some degree conductors.

Electricity is found to be of two kinds, *negative* and *positive;* but in what the difference consists is not ascertained. These two electricities are sometimes called the *vitreous* and *resinous;* the former usually belonging to glass, and the latter to amber, gum, and similar substances.

If a small pith ball, suspended on a silken thread, be brought near the tube when excited, the tube will attract the ball, and the ball will become positively electrified, that is, will have more than its natural share: if another ball be treated in the same way, and then the two brought together they will repel one another.

If a roll of sealing wax or other resinous substance be excited, and a pith ball be brought near it, the ball will be attracted: and if another b

placed in the same situation, and then the two made to approach, they will repel one another.

But if a ball that has been excited by the glass be brought near one that has been excited by the wax, they will then attract each other. These experiments prove that bodies similarly electrified repel each other, and that bodies dissimilarly electrified attract each other.

To explain these facts, it is supposed that the glass tube by being excited possesses more than its natural share of the electric fluid, part of which it gives to the ball brought near it, and that the wax by excitation parts with some of its electricity and has less than its natural share, and of course takes away a part of that contained in the ball placed near it. When therefore these balls are brought together they attract one another to restore the equilibrium: that is, the one positively electrified gives out its superabundance to that which is negatively electrified, or which has less than its natural portion.

Some are of opinion that the electric fluid is the matter of *light*; and its influence is observed in all the departments of nature.

Machines have been contrived for rubbing electrics and conductors together, and for collecting the electric fluid from surrounding bodies: these are called Electrical Machines, of which there are various kinds. The following description refers to one of the most common and most useful. See Plate ELECTRICITY, Fig. 1. L M is a glass cylinder turned by the handle B against a rubber, to which is attached a piece of silk D. By the friction of the glass against the rubber, the electricity is collected

and carried to the conductor E. The rubber is fastened to a glass pillar, G, and the conductor E stands likewise on glass, the cylinder L M is also insulated, therefore before the machine can be worked with effect, a chain must be hung on the rubber to communicate with the table, and by means of the table with the earth. By this chain the electricity is collected, for the rubber having parted with all it has, is supplied from the ground.

If an ostrich's feather be placed in the hole *x* of the conductor E, and the machine worked, the parts of the feather will endeavour to avoid each other, and stand erect, because the several filaments being electrified with the same electricity repel each other. The electrical bells, fig. 2, shew the manner in which electricity is communicated. The two outer bells *z z* are suspended on chains, the middle one is insulated or hung on a silken thread: the two small brass balls *a a* are likewise insulated. If the apparatus be hung on the conductor E, and the machine worked, the bells *z z* will become electrified or have more than their natural share of electricity, and will attract the balls *a a*, which will receive from the bells a part of their superabundant electricity, and will carry it to the bell *x*, this by means of the chain conveys it to the earth, the great repository of electricity: hence so long as the machine is worked the bells will keep ringing. If an apparatus of this kind be connected with a conductor on the outside of a building, it will serve to give notice of the approach and passage of any strongly electrified cloud.

Electricity may be communicated to the whole surface of any glass, or to any given part of it,

if that part be covered with a metallic surface, as tinfoil. This is called coating the glass. A glass jar, fig. 3, coated about three fourths over, leaving the upper rim two or three inches deep quite free from coating, is called a Leyden-jar, so named from the town at which it was first made. If the knob *x* be brought near the conductor E while the machine is working, it will be charged, provided the jar is held in the hand, or stands on a table, &c. which communicates with the earth, because the inside will receive from the conductor more than its natural share, but, as no body can contain in the whole, more than a certain quantity, it will throw off as much from the outside as it receives superabundant inside, of course the two sides of the jar will be in different states of electricity, the inside *plus*, and the outside *minus*, and the glass rim being a non-conductor, the electric fluid cannot of itself pass from the inside to the outside, but if the discharging rod, fig. 4, be brought to the jar, so that the knob *x* shall touch the outside coating, and the knob *z* touch the wire that communicates with the inside of the jar, then, in an instant, the extra fluid of the inside, will pass through the wire *z m x* to the outside, and the equilibrium will be restored. If instead of the discharging rod, a person touch the outside coating with one hand, and bring the knuckle of a finger of the other hand to the wire *x*, which communicates with the inside, his body becomes the discharger, and he will feel a shock, which will be more or less severe, as the phial is more or less charged. Any number of persons may receive the shock if they all hold hands, and the person at one extremity touch the outside of the

jar while the person at the other extremity touch the wire *x* of the jar.

Several Leyden jars connected together, Fig. 5, by making a communication between all the outsides, and another between all the insides, form an electrical battery. By means of this, if gunpowder, gold leaf, or any other inflammable substance be laid on the glass plate *x x*, and an electrical charge be sent through them, they will instantly take fire. Slender wire may be made red hot, and small animals killed with the electrical battery.

Fig. 6. is an electrometer intended to measure the degree to which any jar, or battery is charged, for if the wire *a* be unscrewed from the stand, and be fixed at *x* on the conductor, or *x* of the Leyden-jar, or at F in the battery, when they are charged or charging, then in proportion to the quantity of electricity thrown in, the index *u* will make a smaller or greater angle with the pillar *b a*.

It is now ascertained that lightning and electricity are the same ; that is, lightning is the rapid motion of vast masses of the electric matter, and thunder is the noise produced by the motion of lightning. Metallic points silently attract electricity from the bodies charged with it, hence the use of pointed conductors to secure buildings from the effects of lightning. The Auroræ Boreales, or northern lights, are the effects of the electric fluid passing through highly rarefied air.

Earthquakes, whirlwinds, and water-spouts are generally accompanied with, and dependant upon electrical phenomena. There are three kinds of fish that possess the power of giving the electrical shock similar to that which is experienced from the Ley-

den-jar: these are the Torpedo, the Gymnotus and the Silurus Electricus. Electric sparks, shocks, &c. have been applied to the cure of various diseases.

Element, in physiology, a term used by philosophers to denote the original component parts of bodies, or those into which they are ultimately resolvable. In the ancient and still common sense of the word, the elements are understood to be four in number; namely, fire, air, earth and water. Modern inquirers are inclined to limit their number to two, an active and a passive principle. The first they suppose to be *heat*, but the second they cannot determine, and are even disposed to resolve the whole into this one; and they conclude, with becoming diffidence, that, "the universe may be composed of many elements, or of *one* element; and that of the nature of these elements, or of the single one, they know nothing."

It is remarkable, that all the researches of modern science tend to that doctrine of *fire* which Zoroaster taught so many thousand years ago.

Elephant, an animal, which is, when full grown, from seventeen to twenty feet high; and its body so bulky, that the belly reaches nearer the ground than might be conceived of a creature of its height. The trunk is, properly speaking, only the nose continued to a great length; its substance is fleshy, but firm, being composed of three series or orders of fibres: this trunk the creature can contract or protrude forward with great violence, from the length of one foot to five or more.

At Paris, some curious experiments have been lately made, on the power of music over the sensi-

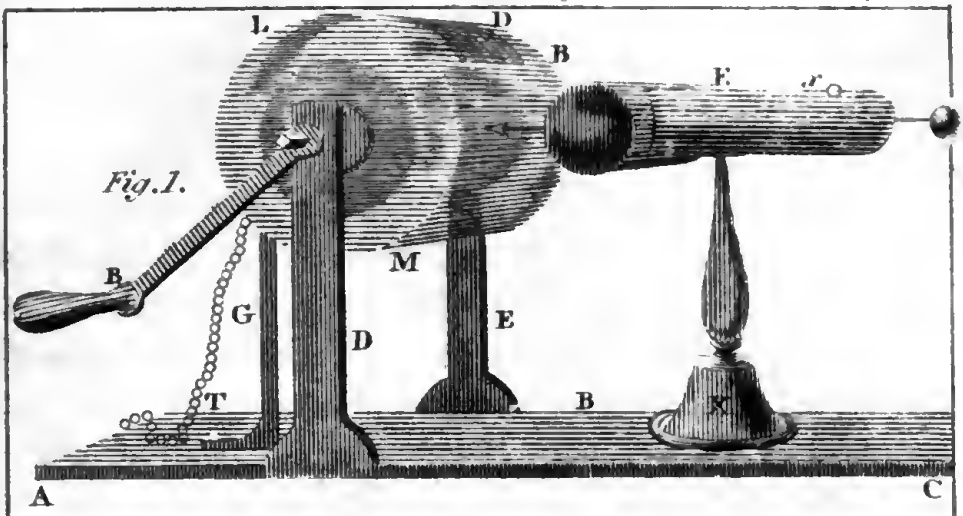



*Fig. 1.*

*Electrical Bells.*

*Leyden Jar.*


*Fig. 2.*


*Fig. 3.*

*Discharging Rod.*

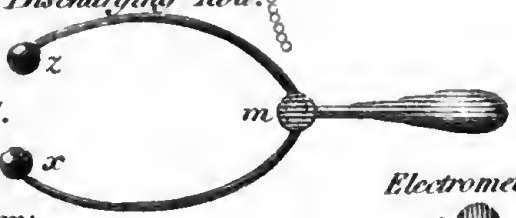
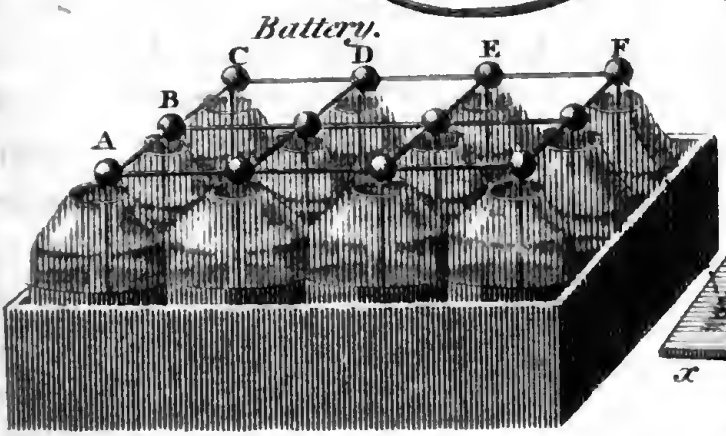



*Fig. 4.*

*Electrometer.*

*Battery.*



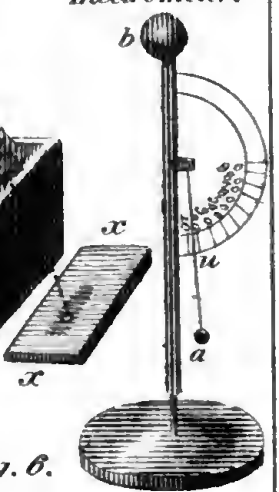




*Fig. 5.* *Fig. 6.*

Cooper sculp.

*Published by J. Harris, St Pauls Ch. Yd. 1811.*

bility of the elephant. A band of music went to play in a gallery surrounding the upper part of the stalls in which were kept two elephants, distinguished by the names of *Margaret* and *Hans*. Dead silence was procured: some provisions of which they were very fond were given to engage their attention; and the musicians began to play. It no sooner struck the ears of the two elephants, than they ceased from eating, and turned, in surprise, to observe whence the sounds proceeded. At sight of the gallery, the orchestra, and the assembled spectators, they discovered a considerable alarm, as if they imagined that there was some design against their safety: but the music soon over powered their fears; and all other emotions were completely absorbed in their attention to it. Music of a bold and wild expression excited them to turbulent agitations, expressive either of violent joy, or of rising fury. A soft air performed on the bassoon evidently soothed them to gentle and tender emotions. A gay and lively air moved them—especially the female—to demonstrations of highly sportive sensibility. Other variations of music produced corresponding changes in the emotions of the elephants. See Pl. Nat. Hist. fig. 14.

ELEPHANT, *Knights of the*, an order of knighthood in Denmark. It is also called the order of St. Mary. Its institution is said to have been owing to a gentleman among the Danish croisées having killed an elephant, in an expedition against the Saracens, in 1184, in memory of which king Canutus instituted this order, the badge of which is a towered elephant, with an image of the holy

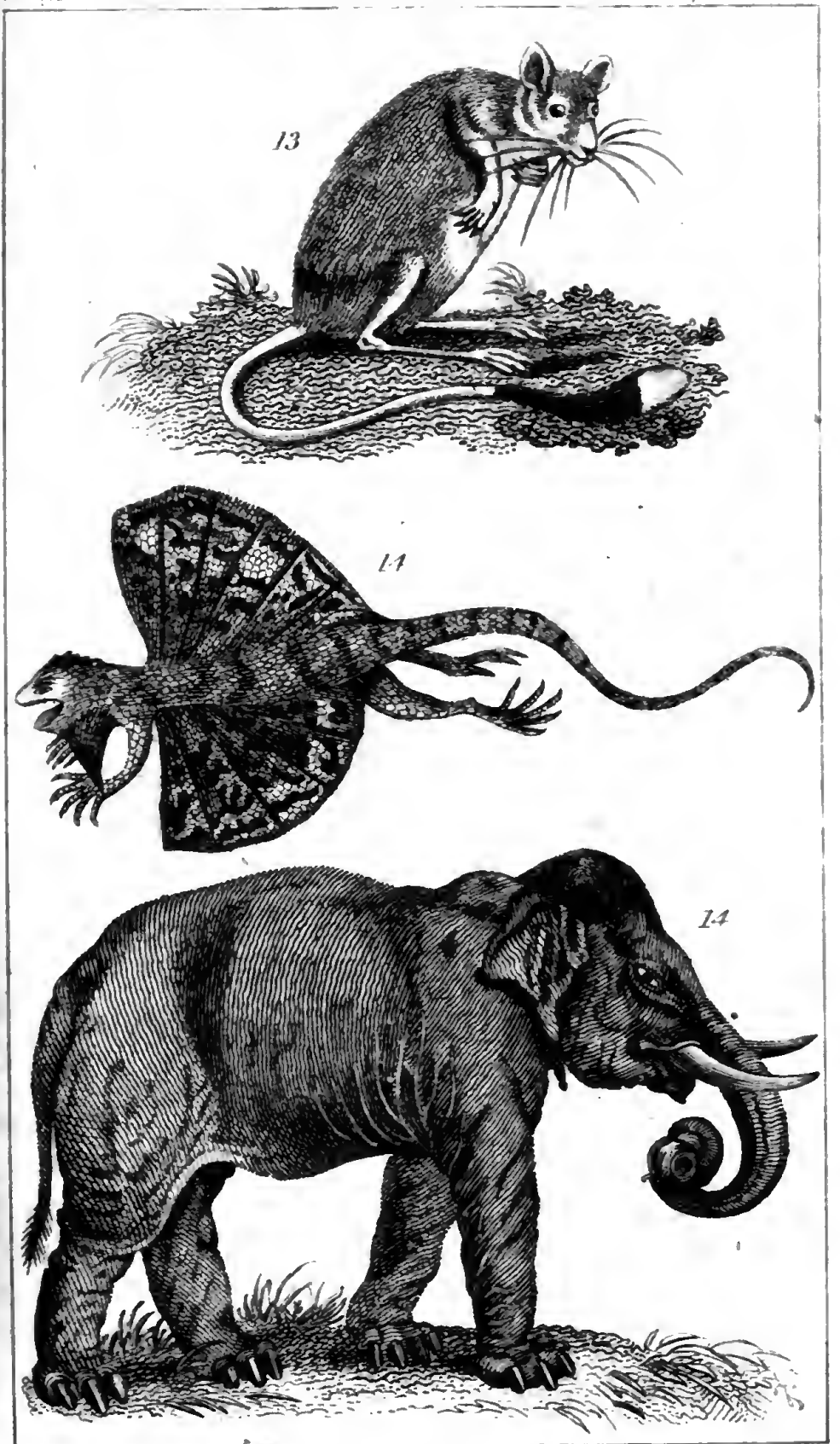
virgin encircled with rays, and suspended by a watered sky-coloured ribbon.

Ell, a measure of length, different in different countries; but those mostly used in England, are the English and Flemish ells; the former, three feet nine inches, or one yard and a quarter; and the latter only twenty-seven inches, or three-quarters of a yard. In Scotland, the ell contains 37 2-10ths English inches.

Ellipsis, in rhetoric, a figure nearly allied to preterition, when the orator, through transport of passion, passes over many things: which, had he been cool, ought to have been mentioned. In preterition, the omission is designed; which in the ellipsis, is owing to the vehemence of the speaker's passion, and his tongue not being able to keep pace with the emotion of his mind.

Elm, in Botany, a tree of the first magnitude, the wood of which is very serviceable where it may lie continually dry or wet, in extremes. Accordingly, it is proper for water-works, mills, pumps, aqueducts, and ship-planks beneath the water-lines. It is also of use for wheel-wrights, handles for single saws, axletrees, and the like. The clearness of the grain makes it also fit for all kinds of carved works, and most ornaments relating to architecture.

Elocution, in rhetoric, the adaptation of words and sentences to the things or sentiments to be expressed. It consists of elegance, composition, and dignity: the first comprehends the purity and perspicuity of a language, and is the foundation of elocution; the second ranges the words in proper




Cooper sculp.

*Fig. 13.* **Dipus** *jaculus: common Jerboa.*
*Fig. 14.* **Draco** *volans: flying Dragon.*
*Fig. 14.* **Elephas** *maximus: Elephant.*

*Published by J Harris St Pauls Ch.d 1821*

order; and the last adds the ornaments of tropes and figures to give strength and dignity to the whole.

Elogy, a praise or panegyric bestowed upon a person or thing, on account of its merit. Two admirable rules of criticism are furnished upon this subject: 1. The beauty of elogy consists in expressive brevity, and therefore is injured by the presence of two synonymous words; 2. Elogies should not contain a single epithet, but praise by a simple and true relation of facts.

Elongation, in astronomy, the digression or recess of a planet from the sun, with respect to an eye placed on our earth. The term is chiefly used in speaking of Venus and Mercury, the arch of a great circle intercepted between either of these planets and the sun, being called the elongation of that planet from the sun.

But here it is to be observed that it is only a circle which has the sun for its centre; that the greatest elongation is in a line touching the planet's orbit. For in an elliptic orbit it may be, that the elongation from the sun may grow still greater, even after it has left the place where the line joining the earth and planet touches the orbit. For after that, the true distance of the planet from the sun may increase, whilst the distance of the sun and planet from the earth does not encrease, but rather decrease. But, because the orbits of the planets are nearly circular, such small differences may be neglected in astronomy. The greatest elongation of Venus is found by observation to be about forty-eight degrees, and the greatest elongation of Mercury about twenty-eight degrees, upon which account

this planet is rarely to be seen with the naked eye.

Elongation, angle of, is an angle contained under lines drawn from the centre of the sun and planet to the centre of the earth.

Eloquence, the art of speaking well, so as to affect and persuade. Cicero defines it, the art of speaking with copiousness and embellishment. Eloquence and rhetoric differ from each other, as the theory from the practice: rhetoric being the art which describes the rules of eloquence, and eloquence that art which uses them to advantage.

Elysium, or *Elysian Fields*, in heathen theology, plains abounding with woods, fountains, verdure and every delightful object; supposed to be the habitation of heroes and good men, after death.

Embalming, is the opening a dead body, taking out the intestines, and filling the place with odoriferous and desiccative drugs and spices to prevent its putrifying. The Egyptians have always been celebrated for their adherence to this practice, and the skill with which they performed it. With some variation, it is still one of the peculiar customs of that nation. It appears to have been a metaphysical notion, inculcated as of their religion, that the soul continued with the body. There naturally followed an affectionate desire to do every thing that living creatures can suppose acceptable to the dead. They were even desirous of having the dead bodies of their parents in their houses, and at their tables, and believed, as has been suggested, that their souls were present also; and it was essential to this gratification that those bodies should be preserved in the most perfect manner possible.

Embargo, in commerce, an arrest on ships, or

merchandize, by public authority; or a prohibition of state, commonly on foreign ships, in time of war, to prevent their going out of port; sometimes to prevent their coming in; and sometimes both, for a limited time. Embargo differs from *quarantine*, insomuch as this last is always for the term of forty days, in which persons from foreign parts infected with the plague, are not permitted to come on shore.

Embassador, See Ambassador.

Ember-weeks, or *days*, in the Christian Church are certain seasons of the year set apart for the imploring God's blessing, by prayer and fasting, upon the *ordinations* performed in the church at such times.

Emblem, a kind of painted enigma, or certain figures painted or cut metaphorically, expressing some action. Thus *friendship* has been represented under the beautiful emblem of a *girl*, one of whose arms encircles a leafless tree: and the olive was an emblem of *peace;* so esteemed, probably, because it belonged to the labours of the husbandman, and the productions of the earth constitute that *plenty* which is an attendant on peace.

Embossing, in architecture and sculpture, the forming or fashioning works in relievo, whether cut with a chissel, or otherwise. Embossing is a kind of sculpture, wherein the figures project from the plane whereon it is cut; and according as the figures are more or less prominent, they are said to be in alto, mezzo, or basso relievo; or high, mean or low relief.

Embroidery, a work in gold, or silver, or silk-thread, wrought by the needle upon cloth, stuffs, or

muslin, into various figures. There are several kinds of embroidery; as, 1. Embroidery on the stamp, where the figures are raised and rounded, having cotton or parchment put under them to support them. 2. Low embroidery, where the gold and silver lie low upon the sketch, and are stitched with silk of the same colour. 3. Guimped embroidery; this is performed either in gold or silver; they first make a sketch upon the cloth, then put on cut vellum, and afterwards sew on the gold and silver with silk-thread: in this kind of embroidery they often put gold and silver cord, tinsel, and spangles. 4. Embroidery on both sides; that which appears on both sides of the stuff. 5. Plain embroidery, where the figures are flat and even, without cords, spangles, or other ornaments.

Emerald, in natural history, a genus of precious stones, of a green colour, and next in hardness to the ruby. The genuine emerald, in its most perfect state, is, perhaps, the most beautiful of all the gems: it is found of various sizes, but usually small; a great number of them are met with of about the sixteenth part of an inch in diameter, and they are found from this to the size of a walnut. The oriental emeralds are found in the kingdom of Cambay. The American, principally about Peru; and the European, chiefly in Silesia.

Emersion, in astronomy, is when any planet that is eclipsed begins to emerge or get out of the shadow of the eclipsing body. It is also used when a star, before hidden by the sun as being too near him, begins to re-appear or emerge out of his rays.

Emery, in natural history, a rich iron-ore found in large masses of no determinate shape, or size,

extremely hard and very heavy. It is usually of a dusky brownish-red on the surface, but when broken, is of a fine, bright, iron-grey, but not without some tinge of redness, and is spangled all over with shining specks, which are small flakes of a foliaceous talc, highly impregnated with iron. It is also sometimes very red, and then usually contains veins of gold. Emery is prepared by grinding in mills, and the powder is separated into parcels of different degrees of fineness by washing; these are called the first, second, and third sort; the first being that which remains longest suspended in water; the others, such as sink sooner from the same liquor, and from which it is poured, while yet turbid, to settle for the finer kind. These several sorts are of great use to various artificers in polishing and burnishing iron and steel works, marble cutting and scolloping glass, &c. The lapidaries cut the ordinary gems on their wheels, by sprinkling the wetted powder over them, the wheels they use being usually of lead, with a small admixture of pewter, that their softness may admit the emery better. It will not cut diamonds.

Emir, a title of dignity among the Turks, signifying a prince. This title was first given to the caliphs, but when they assumed the title of Sultans, that of Emir remained to their children, as that of Cæsar among the Romans. At length the title became attributed to all who were judged to descend from Mahomet by his daughter Fatimah, and who wear the green turban instead of the white. The Turks make an observation, that the emirs, before their fortieth year, are men of the greatest gravity, learning, and wisdom: but after this, if they are

not great fools, they discover some signs of levity and stupidity. This is interpreted by the Turks as a sort of divine impulse, in token of their birth and sanctity. The Turks also call the viziers, bashaws, or governors of provinces, by this name; which is said to be the root of the English word *admiral*.

EMPEROR, a title of honour among the antient Romans, conferred on a general who had been victorious, and now made to signify a sovereign prince, or supreme ruler of an empire: it signifies a commander.

EMPIRE, a government; or the territory over which a government prevails; or the government or territory of an emperor.

ENAMEL, a kind of coloured glass, used in enamelling and painting in enamel. Enamels have for their basis a pure crystal-glass or frit, ground up with a fine calx of lead and tin prepared for the purpose, with the addition usually of white salt of tartar. These ingredients baked together, are the matter of all enamels, which are made by adding colours of this or that kind in powder to this matter, and melting or incorporating them together in a furnace. Enamels are used either in counterfeiting or imitating precious stones, in painting in enamel, or by enamellers, jewellers, and goldsmiths, in gold, silver, and other metals.

ENAMEL, *painting in*, is performed on plates of gold or silver, and most commonly of copper, enamelled with the white enamel: the colours are melted in the fire, where they take a brightness and lustre like that of glass. This painting is prized for its peculiar brightness and vivacity, which is very permanent; the force of its colours not being

effaced or sullied by time, as in other painting, and continuing always as fresh as when it came out of the workman's hands: it is usually in miniature, being the more difficult the larger it is, by reason of certain accidents to which it is liable in the operation. When the colours are all laid, the painting is gently dried over a slow fire to evaporate the oil, and the colours afterwards melted to incorporate them with the enamel, making the plate red hot in a fire. Afterward, that part of the painting is passed over again which the fire has in any degree effaced, strengthening the shades and colours, and committing it again to the fire, observing the same method as before, which is repeated till the work is finished.

ENCHASING, or CHASING, the art of enriching and beautifying gold, silver, and other metal-work, by some design represented thereon, in low relievo. It is performed by punching or driving out the metal, to form the figure, from within side, so as to stand out prominent from the plane or surface of the metal. For this purpose, a number of fine steel-blocks, or puncheons, of divers sizes, are provided; and the design being drawn on the surface of the metal, they apply the inside upon the heads and tops of these blocks, directly under the lines or parts of the figures; then, with a fine hammer, striking on the metal, sustained by the block, the metal yields, and the block makes an indenture, or cavity, on the inside, corresponding to which there is a prominence on the outside, which is to stand for that part of the figure.

ENFILADE, in the art of war, is used in speaking of trenches or other places, which may be scoured

by the enemy's shot, along their whole length. In conducting the approaches at a siege, care must be taken that the trenches be not enfiladed from any work of the place.

Engine, in mechanics, a compound machine, made of one or more mechanical powers, in order to raise, cast, or sustain any weight, or produce any effect which could not be easily effected otherwise. Engines are extremely numerous; some used in war, as the battering ram, ballista, waggons, chariots, &c. others in trade and manufactures, as cranes, mills, presses, &c. others to measure time, as clocks, watches, &c. and others for the illustration of some branch of science, as the orrery, cometarium, and the like. In general, it may be observed, concerning engines, that they consist of one, two, or more of the simple powers variously combined together; that in most of them the axis in peritrochio, the lever, and the screw are the constituent parts; that in all, a certain power is applied to produce an effect of much greater moment; and that the greatest effect, or perfection, is when it is set to work with four ninths of that charge which is equivalent to the power, or will but just keep the machine in equilibrio.

Engine, *Steam*. See Steam.

Engineer, in the military art, one who, by a perfect knowledge in mathematics, delineates upon paper, or marks upon the ground, all sorts of forts, and other works proper for offence and defence. He should understand the art of fortification, so as to be able, not only to discover the defects of a place but to find a remedy proper for them, as also

how to attack as well as to defend. When, at a siege, the engineers have surveyed the place, they are to make their report to the general, acquainting him which part they judge the weakest, and where approaches may be made with most success. Their business is also to delineate the lines of circumvallation and contravallation, taking all the advantages of the ground; to mark out the trenches, places of arms, batteries, and lodgments, taking care that none of their works be flanked or discovered from the place.

ENGLAND, the southern division of Great Britain, situated in the Atlantic Ocean, between 2° east and 6° west longitude, and between 49° 55′ and 55° 55′ north latitude. There are in England, including Wales, fifty-two counties, two archbishoprics, twenty-four bishoprics, two universities, twenty-five cities, upwards of eight hundred towns, and near ten thousand parishes. In civil and political affairs, England is divided into forty counties; in the administration of law and justice, into six circuits; and in church government, into two provinces. Each county has its lord-lieutenant and its sheriff, and is subdivided into hundreds. For each circuit two judges are from time to time appointed, who visit it in the spring and autumn. In holding the lent, or spring, assizes, the northern circuit extends only to York and Lancaster; the assizes at Durham, Newcastle, Carlisle, and Appleby being held only in the autumn, when it is distinguished by the name of the *long circuit*. The following is a list of the *circuits*, which includes also the names of the counties:

1. "Home circuit," Essex, Hertford, Kent, Surry, and Sussex.

2. "Norfolk circuit," Bucks, Bedford, Huntingdon, Cambridge, Suffolk, and Norfolk.

3. "Oxford circuit," Oxford, Berks, Gloucester, Worcester, Monmouth, Hereford, Salop, and Stafford.

4. "Midland circuit," Warwick, Leicester, Derby, Nottingham, Lincoln, Rutland, and Northampton.

5. "Western circuit," Hants, Wilts, Dorset, Somerset, Devon, and Cornwall.

6. "Northern circuit," York, Durham, Northumberland, Lancaster, Westmoreland, and Cumberland.

Middlesex and Cheshire are not comprehended in the above circuits; the former being the seat of the supreme courts of justice, and the latter a county-palatine. There are still distinct courts of chancery in Lancaster and Durham, with chancellors; and there is a court of exchequer at Chester, of a mixed kind, both for law and equity, of which the chamberlain of Chester is judge: there are also other justices in the counties palatine, to determine civil actions, and pleas of the crown.

ENGLAND, *Church of*, also called the reformed religion (with reference to that of Rome), a system of Christianity founded upon the doctrines of Luther. Its dogmas are set forth in *thirty-nine articles*, commonly known by that name. Its government is episcopal, that is, exercised by bishops, who are, in effect, appointed by the crown, the king being, very properly, the head of the church.

The power of making laws in the church belongs to the *convocation*.

ENGRAVING, the art of cutting metals and precious stones, and representing designs thereon. Engraving, properly a branch of sculpture, is divided into several other branches, according to the matter whereon it is employed, and the manner in which it is performed. The original way of engraving on wood is at present denominated cutting in wood; that on metals with aquafortis, is named etching; that by the knife, burnisher, punch, and scraper, is called mezzotinto; that on stones for inscriptions, stone-cutting; and that performed with the graver, on metals or precious stones, keeps the primitive name of engraving.

ENGRAVING *on copper* is performed with the graver on a plate which, being well polished, is covered over thinly with virgin-wax, and then smoothed, while warm, with a feather, so that the wax be of an equal thickness on the plate; and on this the draught or design, done in black lead, red chalk, or ungummed ink, is laid with the face of the drawing on the wax; then they rub the reverse side, which causes the whole design of the drawing to appear on the wax. The design, thus transferred, is traced through on the copper, with a point, or needle; then heating the plate, and taking off the wax, the strokes remain to be followed with the graver. In the conduct of the graver consists almost all the art, which depends not so much upon rules as upon practice, and the habitude, disposition, and genius of the artist, the principles of engraving being the same with those of painting; for if an engraver be not a master of design, he can

never arrive at any degree of perfection in the art. The instruments necessary for this sort of engraving are, besides a graver, a cushion (or sand bag, made of leather, to lay the plate on, in order to give it the necessary turns and motions); a burnisher, made of iron or steel, round at one end, and usually flattish at the other, to rub out slips and failures, soften the strokes, &c. a scraper, to pare off the surface, on occasion; and a rubber, to fill up the strokes that they may appear the more visible.

In engraving on precious stones, use is made of either the diamond or of the emery. The diamond, which is the hardest of all stones, is only cut by itself, or with its own matter.

ENGRAVING *on steel* is chiefly employed in cutting seals, punches, matrices, and dyes proper for striking coins, medals, and counters. Engravers in steel commonly begin with punches, which are in relievo, and serve for making the creux, or cavities, of the matrices, and dyes: though sometimes they begin with the creux, or hollowness, but then it is only when the intended work is to be cut very shallow. The first thing done, is that of designing the figures; the next is the moulding them in wax, of the size and depth they are to lie, and from this wax the punch is engraven. When the punch is finished they give it a very high temper, that it may the better bear the blows of the hammer with which it is struck to give the impression to the matrix. The steel is made hot to soften it, that it may the more readily take the impression of the punch; and after striking the punch on it, in this state, they proceed to touch up or finish the strokes

and lines, where, by reason of their fineness, or the too great relievo, they are any thing defective, with steel gravers of different kinds, chissels, &c. being the principal instruments used in graving on steel.

ENIGMA. See ÆNIGMA.

ENNEANDRIA, the name of the ninth class in Linnæus's sexual system, consisting of plants which have hermaphrodite flowers, with nine stamina or male organs. The orders, or secondary divisions, in this class are three, being founded on the number of the styles, seed buds, or female organs. Laurustinus, and cassytha, have one style; rhubarb (rheum), has a triple stigma or summit, but scarce any style; flowering rush has six styles. The genera just enumerated are all that belong to the class Enneandria. The first genus, laurus, is very extensive; comprehending the bay-tree, cinnamon-tree, camphor-tree, benjamin-tree, sassafras-tree, and the avocado or avogato pear.

ENSIGN, in the military art, a banner under which the soldiers are ranged according to the different companies or parties. The European ensigns are pieces of taffety with various figures, arms, and devices painted on them, in different colours: the Turkish ensigns are horses tails.

ENSIGN is also the officer that carries the colours, being the lowest commissioned officer in a company of foot, subordinate to the captain and lieutenant. It is a very honourable post. An ensign is to carry the colours in assault, battle, &c. and should not quit them but with his life; he is always to bear them himself on his left shoulder: on a march he may have them carried by a soldier. If the ensign

is killed, the captain is to carry the colours in his stead.

Entomology, the science of insects, a branch of zöology.

Every animal, properly classed among insects, has a head, antennæ, and six or more feet.

The class of insects is divided by Linnæus into seven orders:

1. "Coleoptera" (from κωλεος "a sheath," and πτερον "a wing") such insects as have crustaceous *elytra*, or shells, which shut together, and form a longitudinal suture down the back of the insect; as the *beetle*.

2. "Hemiptera" (from ημισυ "half," and πτερον), usually have their upper wings half crustaceous, and half membranaceous, not divided by a longitudinal suture, but incumbent on each other; as the *cimex*, or bug.

3. "Lepidoptera" (from λεπις "a scale," and πτερον), have four wings, covered with fine scales, in the form of powder or meal; as the *butterfly*.

4. "Neuroptera" (from νευρον "a nerve," and πτερον), have four membranous, transparent, naked wings, generally resembling net-work; as in the *panorpacoa*.

5. "Hymenoptera" (from υμην "a membrane," and πτερον), have four membranous wings, and a sting.

6. "Diptera" (from δυο "two," and πτερον), have two wings, and *poisers;* as in the fly.

7. "Aptera" (from α "without," and πτερον), have no wings. This last division contains scorpions, spiders, crabs, lobsters, &c.

The general characters by which insects are distinguished are the following: they are furnished with several, six or more, feet; the muscles are affixed to the internal surface of the skin, which is a substance more or less strong, and sometimes very hard and horny; they do not breathe like larger animals, by lungs or gills situated in the upper part of the body; but by a sort of spiracles, distributed in a series or row on each side the whole length of the abdomen; these are supposed to communicate with a continued chain, as it were, of lungs, or something analogous to them, distributed throughout the whole length of the body; the head is furnished with a pair of what are termed antennæ, or horns, which are extremely different in different tribes, and which, by their structure, &c. form a leading character in the institution of the genera into which insects are divided.

Writers on natural history formerly included snails, worms, and the smaller animals, or animalcules, in general, among insects: these are now more properly placed among the tribe vermes, or worm-like animals. Insects have also been denominated bloodless animals, which modern discoveries have shewn to be contrary to fact: some of them, as the cimex lectularius, have been frequently viewed with the microscope, to exhibit in a striking manner the circulation of the blood. In this insect, with a good glass, the vibrations and contractions of the arteries may be distinctly observed.

Most insects are oviparous; of course, the first state in which insects appear is that of an ovum or egg. This relates to the generality of insects, for there are some examples of viviparous insects, as

in the genera Aphis, Musca, &c. From the egg is hatched the insect in its second or caterpillar state; this second state has been usually known by the name of eruca, but Linnæus has changed it to that of LARVA, which see; considering it as a sort of masked form or disguise of the insect in its complete state. The larvæ of insects differ very much from each other, according to the several tribes to which they belong; those of the butterfly and moth tribe (phalæna) are generally known by the name of caterpillars; those of the beetle (scarabæus), except such as inhabit the water, are of a thick, clumsy form. The larvæ of the locust, or grasshopper, (gryllus), do not differ very much in appearance from the complete insect, except being without wings. The larvæ of flies, bees, (musca, apis), &c. are generally known by the name of maggots, and are of thick short form. Those of water beetles (dytiscus) are of highly singular forms, and differ, perhaps, more from that of the complete insect than any others, except those of the butterfly tribe. Some insects undergo no change of shape, but are hatched from the egg complete in all their parts, and they undergo no farther alteration than that of casting their skin from time to time, till they acquire the complete resemblance of the parent animal. In the larvæ state, most insects are peculiarly voracious, as in many of the common caterpillars. In their perfect state some insects, as butterflies, are satisfied with the lightest nutriment, while others devour animal and vegetable substances with a considerable degree of avidity. When the larva is about to change into the chrysalis or pupa state, it ceases to feed, and having

placed itself in some quiet situation, lies still for several hours, and then, by a sort of effort, it divests itself of its external skin, and immediately appears in the different form of a chrysalis or pupa; in this state likewise, the insects of different genera differ almost as much as the larva. In most of the beetle tribe, the larva is furnished with short legs, capable of some degree of motion, though very rarely exerted. In the butterfly tribe it is destitute of legs; but in the locust tribe it differs very little from the perfect insect, except in not having the wings complete. In most of the fly tribe it is perfectly oval, without any apparent motion or distinction of parts. The pupa of the bee is not so shapeless as that of flies, exhibiting the faint appearance of limbs. Those of the dragon-fly (libellula) differ most widely from the appearance of the complete insect; from the pupa emerges the insect in its ultimate form, from which it never changes, nor receives any farther increase of growth.

Different naturalists have attempted to arrange insects into families and genera, particularly the celebrated Linnæus, whose arrangement may be thus explained. He has formed them into seven families or orders, composing his sixth class of animals, Insecta: he defines an insect, a small animal breathing through pores on its sides, furnished with moveable antennæ and many feet, covered with either a hard crust or a hairy skin. The sexes of insects are commonly two, male and female. Neuters are to be met with among those insects which live in swarms, such as ants, bees, &c.

The majority of insects are observed to be annual,

finishing the whole term of their lives in the space of a year or less, and many do not live half that time: nay, there are some which do not survive many hours; but this latter period is to be understood only of the animals when in their complete or ultimate form, for the larvæ of such as are of this short duration, have, in reality, lived a very long time under water, of which they are natives; and it is observed, that water insects, in general, are of longer duration than land insects. Some few insects, however, in their complete state, are supposed to live a considerable time, as bees for instance; and it is well known that some of the butterfly tribe, though the major part perish before winter, will yet survive that season in a state of torpidity, and again appear and fly abroad in the succeeding spring; spiders are also thought to live a considerable time, and some species of the genus cancer are said to live several years, especially the common lobster, &c. It should be observed, however, that these animals, in the opinion of some modern naturalists, constitute a different tribe of beings from insects properly so called.

Entry, *Bill of*, in commerce, a list of goods shipped, and delivered at the custom-house.

Envoy, a person deputed to negotiate some affair with any foreign prince or state. Those sent from the courts of Britain, Spain, &c. to any petty prince or state, such as the princes of Germany, the republics of Genoa, &c. go in quality of envoys, not ambassadors; and such a character only do those persons bear, who go from any of the principal courts of Europe to another, when the occasion is not very solemn or important. There are

envoys ordinary and extraordinary, as well as ambassadors; they are equally the same under the protection of the law of nations, and enjoy all the privileges of ambassadors, only differing from them in this, that they are not treated with equal ceremony.

Epact, in chronology, a number arising from the excess of the common solar year above the lunar, whereby the age of the moon may be found out every year. The excess of the solar year above the lunar is eleven days. Or the epact of any year expresses the number of days from the last new moon of the old year, which was the beginning of the present lunar year, to the first of January. The first year of the *cycle of the moon*, the epact is 0, because the lunar year begins with the solar. On the second, the lunar year has begun 11 days before the solar year; therefore the epact is 11. On the third, it has begun twice 11 before the solar year; therefore the epact is 22. On the fourth, it begins three times 11 days sooner than the solar year; the epact would therefore be 33; but thirty days being a synodical month, must, that year, be intercalated; or that year must be reckoned to consist of thirteen synodical months, and there remains three, which is the true epact of the year; and so on to the end of the cycle, adding 11 to the epact of the last year, and always rejecting the 30, gives the epact of the present year.

To find the epact until the year 1900. Subtract 1 from the golden number, and multiplying the remainder by 11, reject the thirties, and the epact is given.

*A Table of the Golden Numbers, and their Corresponding Epacts, till the year* 1900.

| G. N°. | Epact. | G. N°. | Epact. | G. N°. | Epact. | G. N°. | Epact. |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 6 | 25 | 11 | 20 | 16 | 15 |
| 2 | 11 | 7 | 6 | 12 | 1 | 17 | 26 |
| 3 | 22 | 8 | 17 | 13 | 12 | 18 | 7 |
| 4 | 3 | 9 | 28 | 14 | 23 | 19 | 18 |
| 5 | 14 | 10 | 9 | 15 | 4 | | |

EPHEMERA, the *day-fly*, in zöology, a genus of flies belonging to the neuroptera order, and so called from their living only one day and a night: they have two gibbous protuberances on the top of the head, resembling eyes: add to this, the tail is furnished with hairs, and the antennæ are short. To this genus belong a variety of species, differing from each other in the length of their lives. Some live several days, others do not take flight till the setting of the sun, and die before it rises again. They are very various also, as to size. Sometimes, says M. de Saint Pierre, the duration of the life of an animal is proportioned to that of the vegetable by which it is nourished: many caterpillars live and die with the leaves on which they feed. There are insects that exist only five hours, and such is the *ephemera*. This kind of fly, which is about the size of the little finger, springs from a larva which lives in the water, and is particularly found at the mouths of rivers, on the banks, in the mud of which it makes itself a dwelling. This larva is in existence for three years; at the end of

which term it changes almost suddenly into a fly, which appears about six in the evening, and dies at eleven at night.

Ephemerides, in literary history, an appellation given to those books or journals, which show the motions and places of the planets for every day in the year. It is from the tables contained in these ephemerides, that eclipses, and all the variety of aspects of the planets, are found. The name is also given to periodical publications on various subjects.

Epic, or *heroic poem*, a poem expressed in narration, formed upon a story partly real, and partly feigned; representing, in a sublime style, some signal and fortunate action; distinguished by a variety of great events; and tending to form the morals, and affect the mind with the love of heroic virtue.

In the earliest stages of society, say the *Monthly Reviewers*, poetry has proved a happy vehicle for recording the exploits of the warrior, or describing any uncommon and grand appearance in nature; and these sublime and heroic songs were attended with wonderful effects: but it is to be considered that poetry addresses itself chiefly to the imagination and the passions, which, in men untamed by civilization, are active, vigorous, and susceptible of the warmest impressions; and, that in an improved state of society, both the one and the other are enfeebled by restraint, while the rational powers gather strength by daily exercise. This progress may be traced by any man who will pay attention to the operations of his own mind. Astonishment is succeeded by admiration; admiration leads to inquiry and in-

vestigation; and these cannot be performed without comparing and judging, which form the peculiar province of reason. Hence may be assigned one cause of an age of criticism being unfavourable to the exertion of original poetic genius; for surely the mind that can read a poem with such calmness, as accurately to appreciate its merits and defects, can feel little of that warmth and enthusiasm which the bard wishes to inspire;—a consideration that would be very mortifying to every poet of the present times, did he not experience, in common with his readers, the difficulty of forming a conception truly sublime, or soaring to any great heights in the regions of imagination.

EPICUREAN philosophy, the doctrine or system of philosophy maintained by Epicurus and his followers. His philosophy consisted of three parts, canonical, physical, and ethereal. The first was about the canons or rules of judging. The censure which Tully passes upon him for his despising logic, will hold true only with regard to the logic of the Stoics, which he could not approve of, it being too full of nicety and quirk. Epicurus was not acquainted with the analytical method of division and argumentation, nor was he so curious in modes and formation as the Stoics. Soundness and simplicity of sense, assisted with some natural reflections, was all his art. His search after truth proceeded only by the senses, to the evidence of which he gave so great a certainty, that he considered them as an infallible rule of truth, and termed them the first natural light of mankind.

In the second part of his philosophy he laid down atoms, space, and gravity as the first prin-

ciples of all things. He did not deny the existence of a God, but thought it beneath his majesty to concern himself with human affairs. He held him a blessed, immortal being, having no affairs of his own to take care of, and above meddling with those of others.

As to his ethics, he made the supreme good of man to consist in pleasure, and consequently, supreme evil in pain. Nature itself, says he, teaches us this truth, and prompts us from our birth to procure whatever gives us pleasure, and avoid what gives us pain. To this end he proposes a remedy against the sharpness of pain: this was to divert the mind from it, by turning our whole attention upon the pleasures we have formerly enjoyed: He held that the wise man must be happy, as long as he is wise; that pain, not depriving him of his wisdom, cannot deprive him of his happiness.

Epicycle, in the ancient astronomy, a little circle whose centre is in the circumference of a greater circle; or it is a small orb, or sphere, which being fixed in the deferent of a planet, is carried along with it; and yet, by its own peculiar motion, carries the planet fastened to it round its proper centre.

It was by means of epicycles, that Ptolemy and his followers solved the various phenomena of the planets, but more especially their stations and retrogradations. The great circle they called the excentric or deferent, and along its circumference the centre of the epicycle was conceived to move; carrying with it the planet fixed in its circumference; which in its motion downwards proceeded according to the order of the signs, but, in moving upwards, contrary to that order. The highest point

of a planet's epicycle they called apogee, and the lowest perigree.

Epidemic; a contagious disease is so termed that attacks many people at the same season. There are some epidemics which prevail every year, and which are produced by the various changes of the seasons. Thus, the spring is accompanied by inflammatory diseases; summer by complaints in the stomach and bowels; autumn by catarrhs; and winter by intermittents.

Epigram, in poetry, a short poem or composition in verse, treating only of one thing, and ending with some lively, ingenious, and natural thought or point. Few men have succeeded in this species of poetry; and the greater part of those epigrams that have been most admired, are indebted for their reputation to a pun, or to the perverted sense of some ambiguous term. Yet it cannot be denied that epigrams have sometimes been made a pleasing vehicle for moral truth and pathetic sentiment.

The Latin epigram, by a false taste that prevailed in the beginning of the decay of pure Latinity, endeavours to surprize the reader by a point. Catullus wrote after the Greek manner, for he endeavours to close a natural thought with a delicate turn of words, and with the simplicity of a very soft expression. Martial was in some measure the author of the other way. Boileau says, the finesse and subtilty of the epigram should turn upon the words, rather than the thoughts, by which means he reduces it to the nature of a pun, or equivoque.

Epigraphe, among antiquarians, denotes the inscription of a building, pointing out the time when,

the persons, by whom, the uses, and the like, for which it was erected.

Epiphany, a Christian festival, otherwise called the Manifestation of Christ to the Gentiles, observed on the sixth of January, in honour of the appearance of our Saviour to the magi, or wise men, who came to adore him, and bring him presents. The kings of England and Spain offer gold, frankincense, and myrrh, on the epiphany, or twelfth day, in memory of the offerings of the wise men to the infant Jesus.

Episcopalians, in church-history, an appellation given to those who prefer the episcopal government and discipline to all others. By the test act, none but episcopalians, or members of the Church of England, are qualified to fill any office, civil or military.

Episode, in poetry, a separate incident, story, or action, which a poet invents, and connects with his principal action, that his work may abound with a greater diversity of events: though, in a more limited sense, all the particular incidents of which the action or narration is compounded, are called episodes. Episodes serve to promote the action, to illustrate, embellish, and adorn it, and carry it to its proper period. Episodes are either absolutely necessary, or very requisite. All episodes are incidents, though all incidents are not episodes; because some incidents are not adventitious to the action, but make up the very form and series of it. Examples will explain this distinction: the storm in the first Æneid of Virgil, driving the fleet on the coast of Carthage, is an incident, not an episode, because the hero himself and the whole body

of his forces are concerned in it; and so it is a direct and not a collateral part of the main action. The adventures of Nisus and Euryalus, in the ninth Æneid, are episodes, not incidents, *i. e.* not direct parts of the main action.

Epoch, in chronology, a term or fixed point of time, whence the succeeding years are numbered or accounted. See Chronology.

Epode, in lyric poetry, the third or last part of the ode, the antient ode being divided into strophe, antistrophe, and epode. The epode is now a general name for all kinds of little verses that follow one or more great ones, of what kind soever they be; and in this sense, a pentameter is an epode after an hexameter.

Epsom *water*, see Mineral *waters*.

Equation, in algebra, the mutual comparing two equal things of different denominations, or the expression denoting this equality; which is done by setting the one in opposition to the other, with the sign of equality (=) between them: thus 3 *s.*=36*d.* or 3 feet = 1 yard. Hence, if we put *a* for a foot, and *b* for a yard, we shall have the equation $3a = b$, in algebraical characters.

Equation of time, in astronomy and chronology, the reduction of the apparent time or motion of the sun, to equable, mean, or true time. The difference between true and apparent time arises from two causes, the excentricity of the earth's orbit, and the obliquity of the ecliptic.

Equator, in geography, a great circle of the terrestrial globe, equidistant from its poles, and dividing it into two equal hemispheres; one north, and the other south. It is in degrees of the equa-

tor, that the longitude of places are reckoned; and as the natural day is measured by one revolution of the equator, it follows that one hour answers to $\frac{360}{24} = 15$ degrees: hence, one degree of the equator will contain four minutes of time; fifteen minutes of a degree will make a minute of an hour; and, consequently, four seconds answer to one minute of a degree.

Equilibrium, in mechanics, is when the two ends of a lever or balance hang so exactly even and level, that neither doth ascend or descend, but keep in a position parallel to the horizon, which is occasioned by their being both charged with an equal weight.

Equinoctial, in astronomy, a great circle of the celestial globe, whose poles are the poles of the world. It is so called, because whenever the sun comes to this circle, the days and nights are equal all over the globe; being the same with that which the sun seems to describe, at the time of the two equinoxes of spring and autumn.

Equinox, the time when the sun enters either of the equinoctial points, where the ecliptic intersects the equinoctial. It is so called, because when the sun is in these points, the days and nights are of an equal length all the world over. As the sun is in one of them, in the spring, viz. March 20th, it is called the vernal equinox; and in the other, in autumn, viz. September 23d, it is called the autumnal equinox.

Equus. See Horse.

Erinaceous, Europæus, the common hedgehog, is found in all the temperate climates of Europe and Asia. Its whole length is about eleven

inches, its colour generally a grey brown. It lives in hedges and thickets, and subsists on young toads, worms, beetles, crabs, fruits, and birds. It conceals itself in its hole during the day, and by night wanders in search of food. It builds its nest of moss, and produces four or five young ones at a birth. These animals possess the curious, though not completely singular, property of rolling themselves into a compact form, like a ball, their spines only appearing, and presenting to the enemy an armed front, which he generally trembles to assail. The greater the danger it is exposed to, the more closely it is compacted, and it is difficult to compel it from this state to its usual form without the application of cold water, on being immersed in which it appears in its usual shape. It lies in this ball-like form during the winter in its mossy nest, insensible to the extremity of the cold, and, on the approach of spring, resumes its nocturnal researches. It is perfectly harmless, and in some countries is said to be domesticated, and in this state is employed by the Calmucks in their habitations to clear them from various annoying insects. See Plate. Nat. Hist. Fig 15.

Ermin, in heraldry, is always argent and sable, that is, a white field, or fur, with black spots.

Escape, in law, is where one who is arrested gains his liberty before he is delivered by course of law. Escapes are either in civil or criminal cases; and in both respects may be distinguished into voluntary and negligent; voluntary, where it is with the consent of the keeper; negligent, where it is for want of due care in him. In civil cases, after the prisoner has been suffered voluntarily to escape,

the sheriff can never retake him, but must answer for the debt; but the plaintiff may retake him at any time. In the case of a negligent escape, the sheriff, upon fresh pursuit, may retake the prisoner; and the sheriff shall be exeused, if he has him again before any action brought against himself for the escape.

Escutcheon, or *scutcheon*, in heraldry, is derived from the French *escusson*, and that from the Latin *scutum*, and signifies the shield whereon coats of arms are represented.

Esquire, was anciently the person that attended a knight in the time of war, and carried his shield. This title has not, for a long time, had any relation to the office of the person, as to carry arms, &c. Those to whom the title of esquire is now of right due, are all noblemens' younger sons, and the eldest sons of such younger sons; and the eldest sons of knights, and their eldest sons; the officers of the king's courts, and of his household; counsellors at law, justices of the peace, &c. though those latter are only esquires in reputation: besides, a justice of the peace holds this title no longer than he is in commission, in case he is not otherwise qualified to bear it; but a sheriff of a county, who is a superior officer, retains the title of esquire during life, in consequence of the trust once reposed in him; the heads of some ancient families are said to be esquires by prescription. If an esquire be arraigned of high treason, he ought to be tried by a jury, each whereof have 40*s.* of freehold, and 100*l.* in goods; and a knight has no other privilege. The heir-apparent of an esquire, is privileged to keep grey-hounds, setting-dogs, or nets to take partridges

and pheasants, though he cannot dispend 10*l.* of estate of inheritance, or the value of 30*l.* of estate for life.

Esquires *of the king*, are such as have that title by creation, wherein there is some formality used, as the putting about their necks a collar of SS, and bestowing on them a pair of silver spurs, &c. There are four esquires of the body to attend the king's person.

Essence, in chemistry, denotes the purest, most subtile, and balsamic part of a body; extracted either by simple expression, or by means of fire, from fruits, flowers, and the like. Of these there are a great variety, used on account of their agreeable smell and taste, by apothecaries, perfumers, and others. Those extracted by means of fire, with more propriety are to be counted among the essential oils.

Essence of bergamot, is a fragrant essence, extracted from a fruit which is produced by ingrafting a branch of lemon-tree, upon the stock of a bergamot-pear. It is imported from Italy and Sicily, particularly from Reggia and Messina. This spirit is extracted, by paring off the rind of the fruit with a broad knife, pressing the peel between wooden pincers against a spunge, and as soon as the spunge is saturated, the volatile liquor is squeezed into a phial.

Essenes, or Essenians, in Jewish antiquity, one of three ancient sects among that people, who outdid the Pharisees in their most rigorous observances. They allowed a future state, but denied a resurrection from the dead. Their way of life was very singular; they did not marry, but adopted the

children of others, whom they bred up in the institutions of their sect; they despised riches, and had all things in common; and never changed their clothes till they were entirely worn out. When initiated, they were strictly bound not to communicate the mysteries of their sect to others; and if any of their members were found guilty of enormous crimes, they were expelled.

ESTATE, in law, signifies the title or interest that a person has in lands, tenements, or other effects; comprehending the whole in which a person hath any property, and will pass the same. Estates are either real or personal;. otherwise distinguished into freeholds, which descend to heirs; or chattels, that go to executors or administrators. A fee simple is the amplest estate of which our law admits.

Estates are obtained several ways, as by descent from a father to a son; by conveyance or grant; by gift or purchase; or by deed or will.

ESTATE, in politics, a term that is variously defined. One has said that the three estates of Great Britain are, 1. the lords spiritual, 2. the lords temporal, 3. the commons; another has reduced the estates to two, 1. the lords, and 2. the commons; while the usual description of the three estates are, 1. the king, 2. the lords, 3. the commons.

In explaining the term estate generally, it has been said to denote the dominions of some *prince*, or the general *classes* into which the people are divided; but neither of these definitions are correct.

The word, which came into the English language from the French *état*, is derived from the Latin *status*, one of the senses of which is that of *command*, *rule*, or *government*. An estate, then, is a

ruling power, whether it consist in the united voice of many, or the will of one: now the ruling powers of Great Britain are three; the king is one, the lords are one, and the commons are one. The king cannot be omitted in an enumeration of the estates, since it is clear that of *three* voices, he possesses *one*. The lords spiritual cannot be said to constitute an estate, but a part of an estate; for the whole house of lords has but one voice.

An estate is not necessarily the dominions of a prince; since a nation, whatever may be its internal arrangements, is, relatively with other nations, an estate: thus we say *the states or estates of Europe:* nor are the classes into which the people are divided estates, unless those classes constitute *ruling powers.*

Etching, the art of engraving on copper, by means of a pointed instrument, or needle and aqua-fortis, or nitro-muriatic acid. The operations incidental to etching are these: I. Varnishing the plate; II. Tracimg the design; III. Etching; IV. Walling the plate; V. Biting or corroding; VI. Cleansing the plate.

I. "Varnishing the plate." The plate being moderately heated, by exposing the unpolished side to the flame of a candle or to a fire, a piece of varnish, covered with fine and clean silk is to be passed over the opposite surface, leaving a thin coat melted on the plate. The plate is to be held with a hand-vice. The varnish being thus laid on, a ball of cotton, inclosed in silk, is made use of to dab the plate over, in such a manner that no part is left uncovered by the varnish, nor the coating of an unequal or improper depth. The varnish being

thus smoothed on the plate, take a large wax candle, and having driven two nails into a wall, whereon to rest the plate, with the varnished side downward, apply the flame to the varnish, as close as may be without suffering the wick to touch it, and guide it under the whole, till it is of a fine shining black. The plate is then to be set upon its edge to cool, and particular caution observed lest any dust settle upon it while warm.

II. "Tracing the design." The outline of the subject being procured, by drawing, or by tracing with oiled-paper, the paper containing the design in the former case, or a thin sheet of a similar size in the other, is covered, on the side to be laid next the plate, with red chalk. The chalk is to cover the whole; but care must be taken that none which will easily come off be left. The paper being laid on the plate, and fastened to its place, by means of white wax at the corners, the whole outline is to be traced with a needle. On removing the paper, the outline, in chalk, will be found on the varnish.

III. "Etching." The outline, thus obtained, is now to be traced with the needle on the copper, and the whole cleared by wiping the chalk away; which may be done with soft leather. The degree of finishing intended to be given by means of corrosion being completed, and every accidental scratch upon the varnish stopped up, the etching, properly so called, is finished.

IV. "Walling the plate." A composition of wax prepared for the purpose, being made sufficiently warm for the requisite pliancy, is to be placed on all sides of the plate, in the manner of a wall, and fitted to contain a fluid on the surface.

V. "Biting or corroding." The nitrous spirit, attempered with water, is now to be poured on the plate. The varnish is impenetrable; and it corrodes only where the needle has been at work. Experience is here necessary: the liquor is not to be too weak; and, if too powerful, it will not only give the etching a coarse appearance, but break up weak parts of the varnish, and in a violent and rapid manner destroy the whole.

If accidents of this nature occur, the aqua-fortis must be poured off, and the plate washed with pure water, and dried at the fire; after which, the parts improperly exposed to the corrosion are to be covered with a soft varnish, manageable by means of a hair-pencil. The same measures are also to be taken when the lighter parts of the work are supposed to be bit sufficiently deep.

When the aqua-fortis operates, the etching is covered with air bubbles, green with the copper they contain: these are to be removed in a gentle manner, by means of a feather, introduced into the liquor.

VI. "Cleansing the plate." When the corrosion is finished, the plate must be washed and dried. The wall is then to be removed, and the varnish may be cleared away by heating the plate, adding oil, and wiping the whole with a woollen substance.

In this state, a proof is usually obtained from the printing-press; and if, as is commonly the case, the plate is to be finished with the graver, this is what now remains to be done.

"General observations." The plate, properly prepared, is to be procured from the copper-plate

maker; the varnish, wax, and needles are to be had from the dealers in drawing materials.

The soft varnish, is the common varnish rendered somewhat liquid by means of turpentine: its consistence should not be thinner than is necessary for pencilling.

The variation of tone, or of light and heavy strokes, so essential to the print, is not to depend wholly upon the greater or less degree or duration of corrosion to which they are exposed. Needles of various sizes, as they are kept in the shops, are to be employed.

There is another species of etching, at present much practised, by which the effect of drawings in chalk or pencil is represented. In this art, a crayon or pencil is used instead of a needle, and the reverse of the design need not be covered with chalk. The artist, having the varnished plate under his paper, proceeds as if he were simply drawing; and the pressure of the crayon or pencil is sufficient to cause the adhesion of the varnish to the paper, in such a manner as to leave an exact imitation of the design upon the copper, pierced through the varnish, and ready to receive the aqua-fortis. See VARNISH.

ETHER. The action of the more powerful acid, on alcohol, gives rise to an order of compounds of some importance from their peculiar properties. These, as produced by the different acids, vary somewhat in their qualities: they also agree, however, in the possession of certain general properties; they are highly volatile, odorous, pungent, and inflammable, miscible with water, and capable of combining with alcohol, in every proportion.

These compounds are named ethers; the specific name of each being derived from the acid, from the action of which on alcohol it has originated, as the sulphuric, nitric, muriatic, or acetic ether.

Ethics, the doctrine of manners, or science of moral philosophy. See Philosophy.

Etiquette, a term denoting the forms of decorum, and primarily used by the French for a ticket or title affixed to a bag or bundle of papers expressing its contents. It is also used in the Spanish and some other courts to signify a particular account of what is to be daily done in the king's household, and in the chief ceremonies relating to it.

Evaporation, in natural philosophy, is the conversion of water into vapour, which in consequence of becoming lighter than the atmosphere, is raised considerably above the surface of the earth, and afterwards by a partial condensation forms clouds. It differs from exhalation, which is properly a dispersion of dry particles from a body. When water is heated to 212°, it boils, and is rapidly converted into steam; and the same change takes place in much lower temperatures; but in that case the evaporation is slower and the elasticity of the steam is smaller. As a very considerable proportion of the earth's surface is covered with water, and as this water is constantly evaporating and mixing with the atmosphere in the state of vapour, a precise determination of the rate of evaporation must be of very great importance in meteorology.

Eudiometry. The measurement of the quantity of oxygen contained in atmospheric air, or indeed in any gas in which it is not intimately combined, is

named eudiometry, and the instrument by which it is performed, the eudiometer. To attain such a measurement, it is merely necessary to present to atmospheric air, some substance which combines with its oxygen, and which either does not afford any gaseous product, or affords one that is easily abstracted and measured. Different substances have been applied to this purpose. The fluid originally employed by Scheele, in the analysis of the air, the solution of sulphuret of potash, or what is rather more convenient, the sulphuret of lime, is perhaps superior in accuracy to any, at least if the air be not too long exposed to it, and be not in too small quantity proportioned to the quantity of fluid. The instruments for subjecting atmospheric air to such changes as may indicate its proportion of oxygen, have been called eudiometers. When a mixture of nitrous gas is to be made with atmospheric air, the most convenient apparatus consists in a glass tube closed at top, and graduated by a diamond into cubic inches and parts. The lower aperture may be widened, in order that the gases may more easily be passed up, and likewise to afford the facility of its standing alone upon the pneumatic shelf. It is likewise usual and advantageous to fit a stopper in the mouth by grinding; a cubic inch measure will be required for determining the quantities poured up. A bottle will do for this purpose, and the instrument may be made very well by a chemist who is obliged to work for himself; by taking any small bottle whatever, and pouring its contents of water, by successive times, into the tube placed mouth upwards. By this means he will obtain a graduation, which, whether

of the cubic inch or not, will answer the purposes of eudiometry.

When air is to be exposed to a liquid sulphuret, which absorbs the oxygen, the eudiometric tube may be immersed in the liquid. It consists of a small bottle, of the contents of about three ounces, intended to contain the eudiometric liquid; into the neck a tube is accurately fitted by grinding, which holds precisely a cubic inch, and is divided into a hundred equal parts, and on one side the bottle, near its bottom, there is a neck into which a stopper is ground in the usual manner. In the use of this apparatus the bottle is first filled with the liquid employed, which is best prepared by boiling a mixture of quick lime and sulphur with water, filtering the solution, and agitating it for some time in a bottle half filled with common air. The tube, filled with the gas under examination, or with common air, if that be the subject of the experiment, is next put into its place, and, on inverting the instrument, the gas ascends into the bottle, where it is brought extensively into contact with the liquid, by brisk agitation. An absorption of oxygen, if present, ensues, and to supply its place, the stopper in the side of the bottle is opened under water, a quantity of which rushes into the bottle; the stopper is then replaced under water, the agitation renewed, and these operations are alternately performed, till no farther diminution takes place; the tube is then withdrawn, while the neck of the bottle is under water, and after the tube has been kept in this situation for a few minutes, the quantity of the diminution will be seen by the graduated scale upon the tube.

Tubes fitted up for exploding a mixture of hydrogen, or other inflammable gases, with oxygen gas, have been called the eudiometers of Volta; they are usually made very strong, and are provided with two wires, which pass through sockets cemented in holes drilled through the glass, near the top, which is not perforated. The electric spark being passed between these wires, gives fire to the gases, not without some risk of blowing out the confining liquid, or breaking the glass.

Eulogy, a name by which the Greeks call the *panis benedictus*, or bread over which a blessing is pronounced, and which is distributed to those who are unqualified to communicate. The name eulogiæ was anciently given to the consecrated pieces of bread, which the bishops and priests sent to each other, for the keeping up a friendly correspondence; those presents likewise which were made out of respect or obligation, were called eulogiæ.

Europe, one of the quarters of the world, bounded on the north by the Frozen Ocean; on the west by the Atlantic; on the south by the Mediterranean, which separates it from Africa; and eastward by the Archipelago, the Black Sea, the rivers Don, Volga, and Oby; which divide it from Asia. Europe lies between nine degrees, thirty-five minutes, west, and seventy-two degrees, twenty-five minutes, east, longitude, and between thirty-five and seventy-two degrees of north latitude. It is about 3300 miles in length, from cape St. Vincent in Portugal to the river Oby in Russia, and 2,200 miles in breadth, from Cape-Matapan, in the Morea, to Cape-North, in Norway.

II. Its principal peninsulas are those of Spain and Portugal, the Crimea, Norway, Sweden, and Jutland; its mountains, the Pyrenees, the Alps, the Apennines, and the Karpacs or Crapacs; its capes, North, Finisterre, Saint-Vincent, and Matapan; its islands, Great Britain, Ireland, Corsica, Sardinia, Sicily, Malta, Candia, Cyprus, the Archipelago, Majorca, Minorca, Ivica, Zeland, and Fionia; its straits, the Sound, St. George's Channel, Dover Channel, Gibraltar, Messina, and the Dardanelles: its gulphs or bays, those of Bothnia, Finland, Murray, Biscay, Lions, Gênoa, Venice, and Lepanto; its rivers, the Volga, Don, Nieper, Rhone, Danube, and Rhine; its lakes, Onega, Weter, Melor, Geneva, Constance, Major and Corni.

III. The principal geographical divisions of Europe are, 1, the north, 2. the middle, and 3. the south: the north or upper division contains Russia, Sweden, Denmark, Norway, and the islands of Great Britain, Iceland, Greenland, and those of the Baltic; the middle division comprehends Poland, Germany, Austria, Hungary, Bohemia, the Low Countries, and France; the southern division comprehends part of Turkey, the greater part of Greece, Switzerland, Italy, Spain, Portugal, and the islands of the Mediterranean.

IV. The principal political divisions are:

1. Sweden,
2. Denmark,
3. Great Britain,
4. The United Provinces,
5. France,
6. Spain and Portugal,
7. Italy,
8. European-Turkey,
9. Russia,
10. Prussia,
11. Germany,
12. Hungary & Bohemia,
13. Switzerland.

V. The governments of Europe are various: in general, all bear traces of the antient feudal system. Those of Great Britain and Sweden consist in the happy combination of monarchial, aristocratical, and popular power: others, called absolute monarchies, are rather aristocracies; and to this class belong the republics: unless an exception be made in favour of France, which may, at the present moment, be a monarchy of the most arbitrary kind.

VI. The established systems of religious doctrine and discipline, save in the dominions of the Porte, are all Christian.

VII. The languages are various; the principal radical ones are the Latin, the Teutonic, and Sclavonic. The French, a dialect of the Latin, is spoken by all Europeans of education.

VIII. Relatively to the earth in general, the climate of Europe is temperate throughout. Placed in the same comparative view, it is moderate in its productions; and this circumstance, together with its populousness, renders the prevailing character of its inhabitants that of activity and enterprize Several discoveries of the utmost importance in the history of mankind, particularly that of the art of printing, have been made, or at least vigorously employed, in this quarter of the globe. The arts and sciences are pursued with zeal; a spirit of admirable ethics generally diffused; and if Europeans, who would describe themselves as better and more wise than all the rest of mankind, are to be suspected of some partiality, it must yet be allowed that the natives of this part of the earth are at least entitled to rank as highly as those of any other.

EXCELLENCY, a title antiently given to kings, but

at present to ambassadors, governors, and commanders in chief.

Exchange, in commerce, the receipt or payment of money in one country for the like sum in another, by means of *bills of exchange*.

A in London is creditor to B in Paris, to the amount of £. 100. C in London is debtor to D in Paris, in a like sum: by the operation of the bill of exchange, the London creditor is paid by the London debtor, and the Paris creditor is paid by the Paris debtor; and, consequently, two debts are paid, though no specie is sent from London to Paris, or from Paris to London.

This is the principle of a bill of exchange; and the great convenience here represented is the foundation of exchange itself. That variation above and below par, which is called the course of exchange, results from the same causes that act upon the price of commodities of every other kind. If bills upon Paris be scarce, that is, if Paris is but little indebted to London, the London creditor, who wants bills on Paris to remit to that city, is obliged to purchase them dearly; the course of exchange is above par: if, on the other hand, London owes less to Paris, than Paris owes to London, Paris bills will be proportionably plenty, and the exchange with that city below par. Hence, it is a maxim that, when the course of exchange rises above par, the balance of trade runs against the country where it rises.

When merchants have occasion to draw and remit bills for the liquidation of their own debts, active and passive, in distant parts, they meet upon the exchange; where the creditors upon Paris,

when they want money for bills, look out for those who are debtors to it. The debtors to Paris, on the other hand, when they want bills for money, seek those who are creditors upon it. This market is constantly attended by brokers, who relieve the merchants of the trouble of searching for those he wants. To the broker every one communicates his wants, so far as he finds it prudent; and by going among all the merchants, the broker discovers the side upon which the greater demand lies, for money or for bills.

While the *course* of exchange, however, is in a perpetual flux, rising and falling according to the circumstances of trade, the *par* of exchange is of a more permanent nature. As the monies and species of almost every nation differ not only in their current prices, but also in their intrinsic value, there is a just and certain par established between them, according to the real and effective worth of each species, without any regard to their currency in the countries where they are coined; and the par is, by some authors, supposed to be of two sorts, viz. the one of real monies, the other of exchanges, or imaginary species, though both seem to be the same thing, as having a necessary dependance on each other. See PAR.

EXCHANGE also signifies a building, or other place in considerable trading cities, wherein the merchants, agents, bankers, brokers, and other persons concerned in commerce, meet on certain days, and at certain times thereof, to confer and treat together of matters relating to exchanges, remittances, payments, adventures, assurances,

freights, and other mercantile negociations, both by sea and land.

Exchequer, in the British jurisprudence, an ancient court of record, in which all causes concerning the revenues and rights of the crown are heard and determined, and where the crown-revenues are received. It took this name from the cloth that covered the table of the court, which was party-coloured or chequered. This court is said to have been erected by William the conqueror. In the exchequer, some reckon seven courts, viz. those of pleas, accounts, receipts, exchequer-chamber, (which is an assembly of all the judges on difficult matters in law) errors in the exchequer, errors in the king's bench, and lastly, the court of equity in the exchequer: but, for dispatch of business, it is generally divided into two parts; one of which is chiefly occupied in the judicial hearing and deciding of all causes relating to the king's coffers, formerly termed the exchequer of accounts: the other is called the receipt of the exchequer, as being principally employed in receiving and payment of money. Officers of the receipt may take one penny in the pound, as their fee, for sums issued out; and they are obliged, without delay, to receive the money brought thither; and the money received is to be put in chests under three different locks and keys, kept by three several officers. All sheriffs, bailiffs, &c. are to account in the exchequer; and in the lower part, termed the receipt, the debtors of the king, and persons in debt to them, the king's tenants, and the officers and ministers of the court, are privileged to sue one another, or any

stranger, and to be sued in the like actions as are brought in the courts of king's bench and common pleas. The judicial part of the exchequer, is a court both of law and equity. The court of law is held in the office of pleas according to the course of common-law, before the barons; in this court, the plaintiff ought to be debtor or accountant to the king. The court of equity is held in the exchequer chamber before the treasurer, chancellor, and barons; but, generally, before the barons only; the lord chief-baron being the chief judge to hear and determine all causes. The proceedings in this part of the exchequer, are by English bill and answer, according to the practice of the court of chancery; with this difference, that the plaintiff here must likewise set forth that he is a debtor to the king, whether he be so or not. It is in this court of equity that the clergy exhibit bills for the recovery of their tythes. Here too the attorney-general exhibits bills for any matters concerning the crown; and a bill may be exhibited against the king's attorney by any person aggrieved in any cause prosecuted against him on behalf of the king to be relieved therein: in which case the plaintiff is to attend on the attorney-general with a copy of the bill, and procure him to give in an answer thereto; in the making of which he may call in any person interested in the cause, or any officer or others to instruct him, that the king be not prejudiced thereby; and his answer is to be put in without oath. Besides the business relating to debtors, farmers, receivers, accountants, &c. all penal punishments, intrusion, and forfeitures upon popular actions, are matters likewise cognizable by

this court; where there also sits a puisne baron, who administers the oaths to high sheriffs, bailiffs, auditors, receivers, collectors, comptrollers, surveyors and searchers of all the customs, &c.

Excise, from the Belgic word *acciisse*, "tribute," an inland duty, paid in some instances upon the consumption of a commodity, and in others upon the whole sale. The excise was first introduced by the parliament which beheaded Charles I. and its great founder was Mr. Pym. The excise-laws nurse a multitude of offences, and give arbitrary power to a number of individuals very little qualified to exercise it; but they are considered as producing a revenue with a moderate comparative expence in its collection. The excise is one of the most considerable branches of the national revenue. It was formerly farmed out, but is now managed for the government by commissioners, who receive the whole product of the excise, and pay it into the exchequer.

Excommunication, an ecclesiastical penalty or censure, whereby such persons as are guilty of any notorious crime or offence, are separated from the communion of the church, and deprived of all spiritual advantages. In the present state of church-government in England, excommunication is seldom used but as a sort of writ of outlawry on contempt of the bishop's court, in the several description of causes that belong to ecclesiastical jurisdiction. It is published in the church, and if the offender does not submit in forty days, the civil magistrate interposes, and the excommunicated person is imprisoned till he submits, and obtains absolution. Excommunication disables a person from

doing any judicial act, as suing in an action at law, or being a witness.

Execution, in law, the completing or finishing some act, as of judgment or deed, and it usually signifies the obtaining possession of any thing received by judgment of law.

Execution *of judgment*, in criminal cases. This must be pursuant to the judgment, and the king may not alter it, for this reason, that no execution can be warranted by law but where it is according to the judgment given; yet he may grant a pardon, and remit part of the execution in judgment for treason, that is to say, all but beheading. The execution of criminals is to be made by the proper officer; and if the sheriff, or other officer impowered to do it, alters the execution, even so far as to change the place appointed for another, or any other executes an offender, or if he be killed without authority of law, it is felony. Where a person condemned to die comes to life after he is hanged, as the judgment is not really executed till he is dead, he is to be hung up again; and the bodies of felons are forfeited to the king by the execution, who may dispose of them as he pleases.

Executor, in law, a person appointed by another's last will and testament, to have the execution of the same after his decease, and the disposing of the testator's goods and effects, according to the intent of the will. Where there is no executor, there is properly no will; and where there is no will, there can be no executors: but this only regards goods; for where lands in fee are devised, it is a good will, though no executors be named.

Exercise, in animal economy, such an agitation

of the body as is conducive to health. Walking is the most gentle species of exercise. It promotes perspiration, and, if not continued too long, invigorates and strengthens the system. As the most simple and wholesome drink, namely water, is within every body's reach; so this species of simple and wholesome exercise is in every body's power, who has the use of his limbs. To such as can bear it, walking frequently up hill is recommended. The inhabitants of mountainous countries are generally healthy and long-lived. This is commonly attributed to the purity of the air in such places: yet the frequent and necessary exercise of climbing mountains, which these people undergo, adds much to their health and longevity. Every one knows how much walking up a hill tends to create an appetite. This depends upon its increasing the insensible perspiration:—an excretion with which the appetite, and the state of the stomach in general, are much connected. Running is too violent to be used often, or continued for any length of time. The running-footmen in all countries are short-lived:—Few of them escape consumptions, before they arrive at their thirty-fifth year. Sweating and perspiration have been found to be incompatible:—The former always suppresses the latter. Dancing is a most salutary exercise. Fencing calls forth most of the muscles into exercise, particularly those which move the limbs. Too much cannot be said in praise of swimming. Besides exercising the limbs, it serves to wash away the dust which is apt to mix itself with the sweat of our bodies in warm weather. Bathing and swimming, frequently in the summer season, is strongly recommended:

but not too long a stay in the water at one time, lest, instead of increasing the vigour of the constitution, it be lessened. To these species of exercise may be added skating, jumping, the active plays of tennis, bowles, quoits, golf, and the like. Talking—reading with an audible voice—singing and laughing—all promote the circulation of the blood through the lungs, and tend to strengthen these important organs, when used in moderation. The last has the advantage over them all, inasmuch as the mind co-operates with it. "May unfading laurels," says a writer on this subject, "bloom to the latest ages upon the grave of him who said, that, 'every time a man laughs, he adds something to his life.'

Riding in a chariot has but few advantages, inasmuch as we are excluded from the benefit of fresh air; an article, upon which the success of all kinds of exercise in a great measure depends. It should be used only by such persons as are unable to walk or to ride on horseback. It is to be lamented, that those people use this mode of exercise the most, who stand in the greatest need of a more violent species.

Riding on horseback is the most manly and useful species of exercise for gentlemen. Bishop Burnet expresses his surprize at the lawyers of his own time being so much more long-lived (cæteris paribus) than other people, considering how much those of them, who become eminent in their profession, are obliged to devote themselves to constant and intense study; and he attributes it entirely to their *riding* the circuits so frequently, to attend the different courts in every part of the kingdom.

Riding may be varied according to our strength, or the nature of our disorder, by walking, pacing, trotting, or cantering our horse. All those diseases which are attended with a weakness of the nerves, such as the hysteric and hypochondriac disorders, which show themselves in a weakness of the stomach and bowels, indigestion, low spirits, &c. require this exercise. In riding to preserve health, eight or ten miles a day are sufficient to answer all the purposes we would wish for; but in riding to restore health, these little excursions will avail nothing. The mind, as well as the body, must be roused from its languor. In taking an airing, as it is called, we ride over the same ground for the most part every day. We see no new objects to divert us, and the very consideration of our riding for health sinks our spirits so much, that we receive more harm than good from it. Upon this account long journies are recommended to such people, in order, by the variety or novelty of the journey, to awaken or divert the mind. Many have by these means been surprised into health.

With respect to the attention to exercise that should be recommended to those of studious habits, it is very generally observed that how agreeable soever they may be to the mind, they are very far from being equally salutary to the body. The delicate springs of our frail machines lose their activity and become enervated, and the vessels choaked with obstructions, when we totally desist from exercise, and the consequences necessarily affect the brain: a mere studious life is therefore equally prejudicial to the body and the mind. The limbs, under such circumstances, become stiff; an awk-

ward manner is contracted; and a certain disgustful air attends every action. An inclination to study is highly commendable; but it ought not to be carried to the extent of aversion to society and motion. The natural lot of man is to live among his fellows; and whatever may be his situation in the world, there are a thousand occasions wherein he must render himself agreeable; to be active and adroit; to dance with grace; to command the impetuous steed; to defend himself against an enemy; to preserve his life by dexterity, as by leaping, swimming, &c. Many rational causes have therefore given rise to the practice of particular exercises; and those legislators who deserve to be called the most sagacious and benevolent, have instituted opportunities for enabling youth who devote themselves to study, to become expert, also, in laudable exercises.

"We shall walk, run, dance, swim, fence, sail, and ride to little purpose (says Dr. Tissot), unless we make choice of an agreeable friend to accompany us. Solitude is the bane of man; insomuch, that it is difficult to tell which suffers most, the soul in its qualities, or the body in its temperament, from being alone. Too great a concourse of people breeds disease. Too much company is destructive to cheerfulness. For the sake of both mind and body, therefore, we should move in a little circle, and let heaven circumscribe it for us. Let our wives and children be always around us; or, if we are not blessed with these, let a few cheerful friends be our constant companions."

"Exercise, it is said, from the seventh to the eleventh hour after eating, wastes more insensibly

in one hour, than in three at any other time." If this be true, then (supposing you sup at eight o'clock in the evening) that exercise, which is used from five till seven o'clock in the morning, will promote the greatest discharge, in a given time, by insensible perspiration. Such as make dinner their principal meal are excluded from the benefit of this aphorism; as the interval, between the seventh and the eleventh hour with them (supposing they dine at two o'clock in the afternoon) is from nine in the evening till one o'clock in the morning—a time, in which darkness, and the unwholesome night air, forbid walking, riding, and almost every other species of manly exercise we have described.

I know it will be objected here, that we often see labourers return, after a full meal, to their work, without feeling any inconvenience from it. This is like the argument of those who recommend raw flesh to the human species, because the strongest and fiercest animals in nature eat it. It is because they are so fierce and so strong, that they are able to digest raw flesh. In like manner it is, because these men are naturally so strong, that labour immediately after eating does not hurt them. But let me ask, whether you have not observed such people leave their tables with reluctance?—How slowly do they return,—and how many excuses do they form to loiter away a little time, before they renew their work!

But farther: there is another reason why I would recommend this practice of eating the chief meal in the evening, which is indeed a little foreign to our present subject. In a country like this, where the constant labour of every individual is so

very necessary, the general use of this custom would add several hours to every day, and thus have the most beneficial effects upon the agriculture—commerce—and manufactures of the country, exclusive of its influence upon the health of the inhabitants.

After what has been said, I need hardly add, that exercise should never be used with a full stomach. Persons who use exercise, either to preserve or restore health, immediately after eating a hearty meal, resemble the man "who fled from a lion, and a bear met him; and who went into the house, and leaned his hand upon the wall, and a serpent bit him."

EXHAUSTION, in mathematics, a method in frequent use among the ancient mathematicians, as Enclid, Archimedes, &c. that proves the equality of two magnitudes, by a deduction *ad absurdum*, in supposing that, if one be greater or less than the other, there would follow an absurdity.

This is founded upon what Euclid saith in his tenth book, viz. that those quantities, whose difference is less than any assignable one, are equal. For if they were unequal, be the difference never so small, yet, it may be so multiplied, as to become greater than either of them, if not so, then it is really nothing. This he assumes in the proof of the 1st proposition of book 10, which is, that if from the greater of two quantities, you take more than its half, and from the remainder more than its half, and so continually, there will at length remain a quantity less than either of those proposed.

On this foundation mathematicians demonstrate,

that if a regular polygon of infinite sides be inscribed in, or circumscribed about a circle; the space, that is the difference between the circle and the polygon, will by degrees, be quite exhausted, and he circle be equal to the polygon.

Exocoetus, the flying fish, a genus of fishes of which there are three species: we shall particularly notice the Exocoetus exiliens or the Mediterranean flying-fish. This is about fourteen inches in length, and is found principally in the Mediterranean and Atlantic seas, frequently alone, and sometimes in small companies. By the extraordinary length of its pectoral fins it is enabled to quit the water and support a flight, about three feet above the surface, for the distance of eighty or a hundred yards, after which it is obliged to return to the water and moisten its fins, which even in this short progress, become hard and dry. These fishes are persecuted by the dorado under the water, and by the gull, or albatross, above the surface of it, and thus often escape destruction by the one only to incur it from the other. This faculty of maintaining short flights in the air is possessed by several other fishes, particularly by the scorpœna and the trigla. See Plate, Nat. Hist. Fig. 16.

Expansion, in natural philosophy, the enlargement or increase of bulk in bodies, chiefly by means of heat. This is one of the most general effects of caloric, being common to all bodies whatever, whether solid or fluid, or in an aeriform state. In some cases bodies seem to expand as they grow cold, as water in the act of freezing; this however, is known to be no exception to the general rule, but is owing to the arrangement of the particles, or to

crystallization, and is not a regular and gradual expansion like that of metals, or other solid substances, by means of heat. In various metals likewise an expansion takes place in passing from a fluid to a solid state, which is accounted for in the same way. The expansion of solids is exhibited by the PYROMETER (which see); a rod of iron, for instance, becomes sensibly longer and larger in all its dimensions in passing from a low to a high state of temperature. The expansion of fluids is shewn by the thermometer, and is the principle upon which that useful instrument is constructed; by immersing a thermometer into hot water, the mercury, or other fluid, contained in it immediately expands. See THERMOMETER. The degree of expansion produced in different liquids, varies very considerably. In general, the denser the fluid, the less the expansion; water expands more than mercury; and alcohol, which is lighter than water, and expands more than water. The expansion of aeriform fluids may be exhibited by bringing a bladder, partly filled with air, and the neck closely tied, near the fire; the bladder will soon be distended, and will, if the heat be strong enough, burst. Metals expand in the following order, those that expand most are placed first: zinc, lead, tin, copper, bismuth, iron, platina.

EXPLOSION, in natural philosophy, a sudden and violent expansion of an aerial, or other elastic fluid, by which it instantly throws off any obstacle that happens to be in the way, sometimes with incredible force, and in such a manner as to produce the most astonishing effects. It differs from expansion in this, that the latter is a gradual and continued power, acting uniformly for some time, whereas,

the former is always sudden, and only of momentary duration. The expansions of solid bodies do not terminate in violent explosions, on account of their slowness, and the small space through which the metal, or other expanding substance moves. Thus wedges of dry wood driven into stone, and wetted, will cleave the most solid blocks, but they never throw the parts to any distance, as is the case with gunpowder; but the expansion of elastic fluids will burst solid substances, and throw the fragments a great way off: for this two reasons have been assigned: 1. The immense velocity with which aerial fluids expand, when suddenly affected with high degrees of heat: and 2. The great celerity with which they acquire heat, and are affected by it. As an example, air when heated as much as iron, when brought to a white heat, is expanded to four times its bulk, but the metal itself will not be expanded the 500dth part of the space. In the case of gunpowder, which is well known as an explosive substance, the velocity with which the flame moves, is estimated at 7000 feet in a second. Hence the impulse of the fluid is inconceivably great, and the obstacles on which it strikes are hurried off with vast velocity, viz. at the rate of 27 miles per minute. The velocity of the bullet is also promoted by the sudden propagation of the heat through the whole body of air, as soon as it is extricated from the materials of which the gunpowder is made, so that it strikes at once. Hence it has been inferred, that explosion depends first on the quantity of elastic fluid to be expanded: secondly, on the velocity it acquires by a certain degree of heat; and thirdly,

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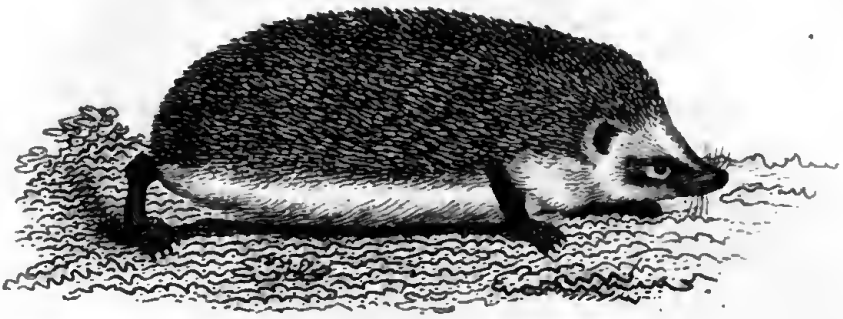

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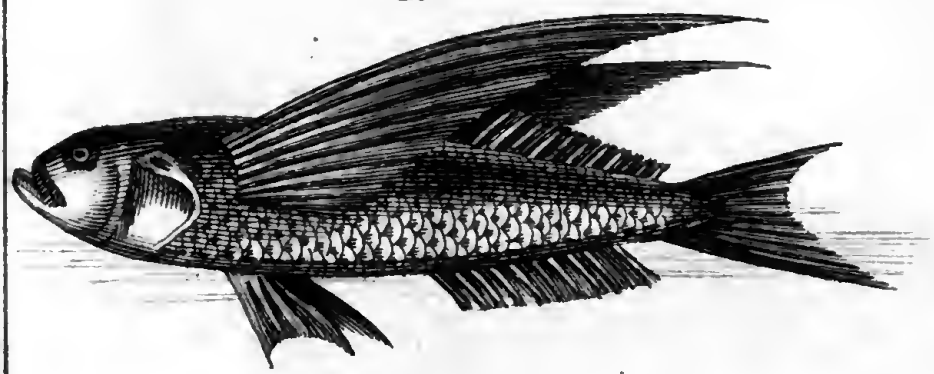

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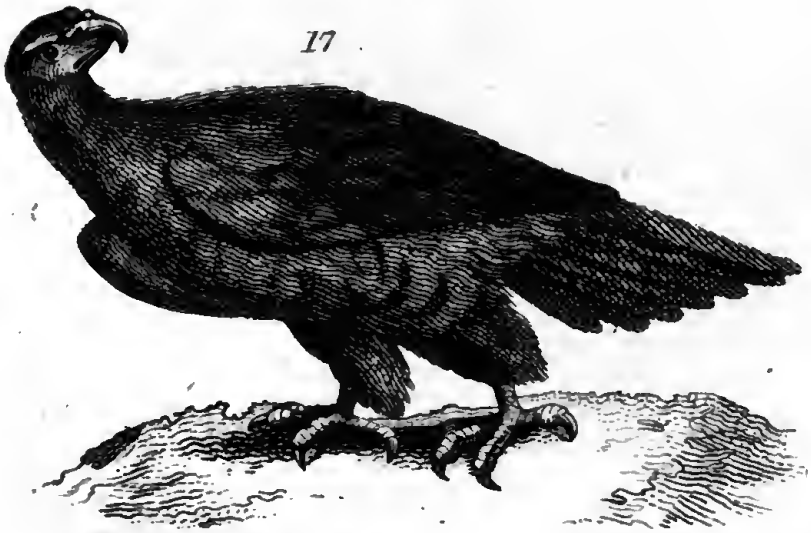

Cooper sculp.

*Fig.15.* **Erinaceus** *Europœus: common Hedge-hog.*
*Fig.16.* **Exocoetus** *exiliens: Oceanic flying-fish.*
*Fig.17.* **Falco** *Chrysaetos: Golden Eagle.*

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on the celerity with which the degree of heat affects the whole expansile fluid.

Exportation, that part of foreign commerce which consists in sending out goods for sale, and which is therefore the *active* part of trade, as importation, or the purchasing of goods, is the passive.

Eye, the organ of vision. The eye-ball is the immediate agent in refracting the rays of light, and collecting them into a point, so as to form an image of the object from which they are reflected. For this purpose, there is in it a series of perfectly transparent parts, which execute the various refractions, a nervous pulp on which the rays of light thus refracted make an impression to be conveyed to the sensorium by the optic nerve. See Optics. The visual organ, simple, when thus considered, becomes much more complicated if we include all the apparatus added for the purposes of protection or assistance. The muscles which move the globe in various directions, the eye-lids, which cover and protect in front, and the parts which secrete the tears, and convey them into the cavity of the nostril, are all so intimately connected in situation and function with the globe, that they must be included in the general description.

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## F.

F, the sixth letter of the alphabet, is, by some, reckoned a mute, by others a semi vowel. It has nearly the same sound as the Greek $\varphi$, or *ph* in English words, and is only written in words of Latin origin, *ph* being used instead of it in those

derived from the Greek. F, as a numeral, denotes 40, and with a dash over it thus $\bar{F}$ 40,000.

F, in the criminal law, a mark put upon the thumb of a felon, with a hot iron, on his being admitted to benefit of clergy.

F, or *fa*, in music, one of the syllables invented by Guido Aretine, to mark the fourth note of the modern scale, which rises thus: *ut*, *re*, *mi*, *fa*. Musicians distinguished two *fa's*, viz. the flat ,and the sharp or natural, called bequarre.

Fable, the narration of an incident by which some moral truth is illustrated and impressed. The fabulist describes the circumstance as having really happened; but it is generally the offspring of his own imagination; hence, when a story is called fabulous, the reality of the event that it relates is intended to be denied. In the farther indulgence of the inventive powers, fabulists have proceeded to personify ideas, and to indue every created thing with the faculties of reason and speech. In so doing, however, though the field he enters may appear extensive, it is not unbounded. He is still confined within certain laws; for there is a considerable difference between romance and absurdity: a rose may be said to speak, but not to lead an army. There is a distinction, though so little observed that a novel word must be used even to express it, between what is supernatural and that which is contranatural. We may exhibit unusual things;

> But not, that nature should revers'd appear,
> Mix mild with fierce, and gentle with severe;
> Prophane her laws to contradiction's height,
> Tygers with lambs, with serpents birds unite.

"We are told by the Grecian writers," says sir William Jones, "that the Indians were the wisest of nations; and in moral wisdom they were very eminent; their system of ethics is yet preserved; and the fables of Vishnusarman, whom we ridiculously call Pilpay, are the most beautiful, if not the most ancient collection of apologues in the world: they were first translated from the sanscrit, in the sixth century, by the order of Buzerchum-ihr, or Bright as the Sun, the chief physician, and afterwards vizir of the great Anúsheriván, and are extant, under various names, in more than twenty languages; but their original title is *Hipotedésa*, or *Amicable Instruction;* and as the very existence of Æsop, whom the Arabs believe to have been an Abyssinian, appears rather doubtful, I am not disinclined to suppose, that the first moral fables which appeared in Europe, were of Indian or Ethiopian origin."

In the same sense as that already considered, the plot or *incident* of an epic or dramatic poem is called the *fable.*

Fabulous *age*, that period in the history of every nation in which supernatural events are represented to have happened.

Face, in anatomy; the bones of the face are divided into those of the upper and under jaw: the upper consists of thirteen bones, and the under is formed of one bone. The muscles of the face are those of the eye-lid, eye-ball, nose, mouth, and lips. The human face is called the image of the soul, as being the seat of the principal organs of sense; and the place whence the ideas, emotions, &c. of the soul are chiefly set to view. Pride and

disdain are shown in the eye-brows; modesty on the cheeks, majesty in the forehead, &c. It is the face shews the sex, age, temperament, health, disease, &c. The face, considered as the index of the passions, habits, &c. of the person, makes the subject of physiognomy. Face, among painters and artists, is used to denote a certain dimension of the human body, adapted for determining the proportion which the several parts should bear to one another: thus, the different parts of the body are said to consist in length, of so many faces.

Factor, in commerce, is an agent or correspondent residing beyond the seas, or in some remote part, commissioned by merchants to buy or sell goods on their account, or assist them in carrying on their trade.

Factory, is a place where a considerable number of factors reside, to negociate for their masters and employers. The most considerable factories belonging to the British, are those established in the East Indies, Portugal, and Turkey.

Faculty, in law, a privilege granted to a person, by favour and indulgence, of doing what, by law, he ought not to do. For granting these privileges, there is a court under the archbishop of Canterbury, called the court of the faculties, the chief officer whereof is styled master of the faculties, who has a power of granting dispensations in divers cases, as to marry without the bans being first published; to eat flesh on days prohibited; to ordain a deacon under age; for a son to succeed his father in his benefice, or a clerk to hold two or more livings.

Faculty, in the schools, a term applied to the

different members of an university, divided according to the arts and sciences taught there; thus, in most universities, there are four faculties: 1. of arts, which include humanity and philosophy; 2. of theology; 3. of physic; and, 4. of civil law. The degrees in the several faculties of our universities are those of bachelor, master, and doctor.

Faculty of advocates, a term applied to the college or society of advocates in Scotland, who plead in all actions before the court of session. They meet in the beginning of every year, and choose the annual officers of the society, viz. dean, treasurer, clerks, private and public examinators, and a curator of their library. The manner of admission into the faculty of advocates is by a trial in the civil law, and Scotch law: the person desiring to be admitted, having, upon petition, obtained a recommendation to the dean of the faculty, he gives a remit to the private examinators, who are nine in number, and who, after their election, having divided the body of the civil law into nine parts, each taking one, appoint a diet for examination; in this diet there must be at least seven present, each of whom examines the candidate; and the question being put, Qualified, yea or no? they give their opinion by balloting, upon which the candidate is either admitted by signing his petition, or remitted to his studies. After the private trial, the dean of the faculty assigns the candidate a title of the civil law, for the subject of a thesis, which being distributed among the advocates, the faculty meet on a day appointed, when three at least of fifteen public examinators dispute against the thesis; and afterwards the faculty give their opinions by balloting,

as in the private trial. If the candidate is found qualified, the dean assigns him a law for an harangue before the lords, which harangue being made, he is admitted a member of the faculty, upon paying the fees, taking the oaths to the government, and an oath to be faithful in his office.

Fæcula, in chemistry, the substance obtained by grinding certain vegetables or grain in water, and the fæcula is that part which, after standing some time, falls to the bottom. Starch is made from the fæcula of wheat.

Fagus, in botany, the beech-tree, a genus of the monœcia order of the polyandria class. It contains three species: of which the beech-tree rises to the height of sixty or seventy feet, and in stateliness, and grandeur of outline, vies with the oak. Its leaves are oval and serrated; its flowers are produced in globular catkins, and succeeded by angular fruit, called *mast*. Its bark has a peculiar silvery appearance, which, added to the gracefulness of its port, and the elegance of its foliage, renders the whole tree among the first in beauty. Its wood is much employed in turnery, and in cabinet-making, particularly in the construction of chairs. The mast yields a good oil for lamps, and is a favourite food with mice, squirrels, and swine.

The chesnut-tree, another species, is capable of growing to a vast size. There is one upon mount Etna, called "*The chesnut-tree for a hundred horses.*" Mr. Howel, who went from Aci to examine it, describes the circumference of its trunk to be one hundred and sixty feet. It is quite hollow, but this does not affect its verdure; for the chesnut, like the willow, depends upon its bark for subsist-

ence, and as it becomes aged loses its internal part. Within the cavity, a house has been built, the inhabitants of which have an oven for drying nuts, almonds, and chesnuts, of which they make conserves; and, what the traveller justly laments, they frequently supply themselves with fuel from the tree under which they live.—It has its name from a tradition that Jane of Arragon, spending some time in Sicily, on her way from Spain to Naples, visited the mountain, and, a storm happening, took shelter, with her train, under this tree, the branches of which were sufficiently extensive to cover all. All that side of the mountain abounds with chesnut-trees. At Tortworth, in Gloucestershire, is a chesnut-tree fifty-two feet round: it is known to have stood there ever since the year 1150, when it was called the Great Chesnut of Tortworth; and is supposed to be nearly a thousand years of age. The wood of the chesnut-tree, as a substitute for oak, is preferable to elm. It was formerly much used in London for the purposes of building; but it is not to be depended upon on these occasions. It is allowed to be excellent for liquor-casks, and recommended as an underwood, for hop-poles and stakes. Its fruit is valuable for swine and deer; and, when the growth of warm climates, as food for man: it is said to have been made into bread.

Fair, a greater kind of market, granted to a town, by privilege, for the more speedy and commodious providing of such things as the place stands in need of. It is incident to a fair, that persons shall be free from being arrested in it for any other debt contracted than what was contracted in the same; or, at least, promised to be paid there.

Fairs abroad are either free, or charged with toll and imposition. The privileges of free fairs consist chiefly, first, in that all traders, whether natives or foreigners, are allowed to enter the kingdom, and are under the royal protection, exempt from duties, tolls, &c. Secondly, that merchants, in going or returning, cannot be molested or arrested, or their goods stopped. They are established by letters-patent from the prince. Fairs, particularly free fairs, make a very considerable object in the commerce of Europe, especially that of the Mediterranean, and inland parts of Germany.

Fairy *rings*. The circles of dark-green grass frequently observed in old pastures, have long been known under the name of fairy rings, and have generally been supposed to be occasioned, in some way or other, by electricity. Dr. Wollaston has, in a late volume of the Transactions of the Royal Society, given a new and very ingenious theory, of which we shall present our readers with a brief account, premising that Mr. Davy, in the course of his lectures at the Royal Institution, had occasion to refer to the subject, and seemed to coincide in opinion with Dr. Wollaston. That which first attracted his notice was the position of certain fungi which are always found growing upon these circles, if examined in a proper season. The position of these fungi led him to imagine that the progressive increase from a central point was the probable mode of formation of the ring: hence he conjectured that the soil, which had once contributed to the support of the fungi, might be so exhausted of some peculiar pabulum necessary for their production as to be rendered incapable of producing a second crop.

The second years crop would, if this theory be just, appear in a small ring surrounding the original centre of vegetation, and at every succeeding year the defect of nutriment on one side would necessarily cause the new roots to extend themselves solely in the opposite direction, and would occasion the circle of fungi continually to proceed, by an annual enlargement, from the centre outwards. An appearance of luxuriance of the grass would follow as a natural consequence, as the soil of an interior circle would always be enriched by the decayed roots of fungi of the year's growth. This theory is supported by some observations of Dr. Withering; and Dr. Wollaston says, by way of confirmation, that whenever two adjacent circles are found to interfere, they not only do not cross each other, but both circles are invariably obliterated between the points of contact: the exhaustion occasioned by each obstructs the progress of the other, and both are starved.

Fakir, an Indian devotee. Some of these victims of superstition even outdo the mortifications and severities of the antient Anchorets; one mangling his body with scourges and knives; another never lying down; and another remaining all his life in one posture. There are also other fakirs, who do not practise such severities: these flock together in companies, and go from village to village, prophesying and telling fortunes. It is said that persons of fortune, in India, become fakirs, and that there are more, sometimes, than two millions of this description of people.

Falco, in ornithology, a genus of birds, of the order of the accipitres, with three toes always be-

fore and only one behind. This genus comprehends the falcon-kind, properly so called: the hawk, gyrfalcon, eagle, buzzard, kite, and others, to the number of about one hundred and thirty-six. They for the most part, are rapacious tribes, and feed on putrified carcases; yet seldom and never but when pressed by extreme hunger attack living animals, they are bold and fly with great speed when high in the air, but slowly in its lower regions; have an exquisite sense of smell, and are very quick-sighted, not gregarious, generally build in clefts of impending rocks, their nests, which are called eyries, a term, however, which merely implies a place of eggs, but a few of them make their nests on the ground.

Falco, chrysaëtos, golden eagle, inhabits Europe and Siberia; flies to a vast height in serene weather, and descends against a storm. The general weight is about twelve pounds. There are two instances in Scotland of this bird having flown away with infants to its nest, yet in both the theft was discovered time enough to extricate them without essential damage; Eagles are very long-lived, many instances occurring of their existing upwards of a century; whence probably the allusion of the Psalmist. "Thy youth is renewed like the eagles." They are capable of enduring abstinence; instances having occurred of the eagles continuing for upwards of twenty days without food of any kind. See pl. Nat. Hist. fig. 17.

Falling-*star*, in meteorology, a phenomenon that is frequently seen, and which has been usually supposed to depend on the electric fluid. Mr. Davy, in a lecture delivered at the Royal Institu-

tion, gave many reasons against this opinion: he conceives that they are rather to be attributed to falling stones. It is observable that when their appearance is frequent they have all the same direction; and it has been remarked that they are the forerunners of a westerly wind in our country.

Fallowing *of land*, a particular method of improving land. It appears that none will find a year's fallowing a loss, let the land be what it will; but, more particularly, the advantage of fallowing consists in, 1. its laying of the land in ridges, and its exposing it to the frost, wind, sun, and dews, all which sweeten and mellow the land very much; the often stirring of it, and breaking the clots, dispose it for the bearing of good crops. 2. its killing the weeds, by turning up the roots to the sun and air, and killing not only the weeds that grew with the last corn, but wild oats, darnel, and other weeds.

False imprisonment, in law. To constitute the injury of false imprisonment, two points are necessary: the detention of the person, and the unlawfulness of such detention. Every confinement of the person is imprisonment, whether in a common prison, or a private house, or even by forcibly detaining one in the streets.

Familiars *of the Inquisition*, bailiffs who assist in apprehending the accused, and carrying them to that prison. They are called *familiares* because they belong to the inquisitor's family. Portuguese noblemen have been ambitious of filling this office; and the same plenary indulgence is granted by the Pope to every single exercise of this function, as formerly to those who succoured the Holy Land.

FARCE, was originally a droll or petty show exhibited by mountebanks and their buffoons in the open streets, to gather the people together. At present it is of more dignity: it is removed from the street to the theatre, and instead of being performed by merry-andrews to amuse the rabble, is acted by comedians, and become the entertainment of a polite audience. Poets have reformed the wildness of the primitive farces, and brought them to the taste and manner of comedy. The difference between the two on our stage is, that comedy keeps to nature and probability, and therefore is confined to certain laws prescribed by ancient critics, whereas farce disallows of all laws, or rather sets them aside on occasion. Hence the dialogue is usually low, the persons of inferior rank, the fable or action trivial or ridiculous, and nature and truth every where heightened and exaggerated to afford the more palpable ridicule.

FARINA *fœcundans*, among botanists, the impregnating meal or dust on the apices or antheræ of flowers, which, being received into the pistil or seed-vessel of plants, fecundates the rudiments of the seeds in the ovary, which otherwise would decay and come to nothing. The manner of obtaining the farina of plants for microscopical observation is this: gather the flowers in the midst of a dry sun-shiny day, when the dew is perfectly off, then gently shake off the farina, or lightly brush it off with a soft hair-pencil, upon a piece of white paper; then take a single talc of isinglass between the nippers, and, breathing on it, apply it instantly to the farina, and the moisture of the breath will make that light powder stick to it. If too great a

quantity is found adhering to the talc, blow a little of it off; and if there is too little, breathe upon it again, and take up more. When this is done, put the talc into the hole of a slider, and applying it to the microscope, see whether the little grains are laid as you desire, and if they are, cover them up with another talc, and fix the ring, but care must be taken that the talcs do not press upon the farina in such a manner as to alter the form.

FARM, in law, a portion of land, employed in the purposes of husbandry, and let out at a certain rent. The same thing, in various parts of Britain, is differently termed: in the north, a *take*, or land *taken* or *hired;* in Lancashire, a *ferme-holt*, or *farm-hold*, in contradiction with *freehold;* in Essex, a *wike*, or *wic*, from a Saxon word, signifying a dwelling.

"To farm," in a general sense, is to hire at a fixed rent any post, situation, or property from which larger but unfixed profits may be obtained: thus one, agreeing to pay a certain yearly sum, in consideration of receiving the tolls at a turnpike, is said *to farm* the turnpike.

FARRIERY. See VETERINARY *Science.*

FASCIS, in Roman antiquity, a bundle of birchen rods, with an axe in their centre, carried before the Roman magistrates as a badge of their authority and office. The use of the fasces was introduced by the elder Tarquin, as a mark of sovereign authority: in after times they were borne before the consuls, but by turns only, each having his day. These latter had twelve of them, carried by so many lictors.

FASCINES, in fortification, faggots of small-wood

of about a foot diameter and six feet long, bound in the middle and at both ends. Fascines are used in raising batteries, making chandeliers, in filling up the moat to facilitate the passage to the wall, in binding the ramparts where the earth is bad, and in making parapets of trenches to screen the men. They are also sometimes pitched over, to be thrown upon the enemy's works in order to set them on fire. They differ from *saucissons*, in being made of small wood; whereas saucissons are made of branches of trees.

Fata *Morgana*, a very remarkable aerial phenomenon, which is sometimes observed from the harbour of Messina and adjacent places, at a certain height in the Atmosphere. The name, which signifies the fairy Morgana, is derived from an opinion of the superstitious Sicilians, that the whole spectacle is produced by fairies, or such-like visionary invisible beings. The populace are delighted whenever it appears, and run about the streets shouting for joy, calling every body out to partake of the glorious sight. This singular meteor has been described by various authors; but the first who mentioned it with any degree of precision was Father Angelucci, whose account is thus quoted by Mr. Swinburne in his tour through Sicily: "On the 15th of August, 1643, as I stood at my window I was surprised with a most wonderful delectable vision; the sea that washes the Sicilian shore swelled up, and became for ten miles in length like a chain of dark mountains; while the waters near our Calabrian coast grew quite smooth, and in an instant appeared as one clear polished mirror reclining against the ridge.

On this glass was depicted, in chiaro-obscuro, a string of several thousand of pilastres, all equal in altitude, distance, and degree of light and shade. In a moment they lost half their height, and bent into arcades, like Roman aqueducts. A long cornice was next formed on the top, and above it rose castles innumerable, all perfectly alike. These soon split into towers, which were shortly after lost in colonnades, then windows, and at last ended in pines, cypresses, and other trees, even and similar. This is the Fata Morgana, which for twenty-six years I had thought a mere fable."

Father, in church history, is applied to antient authors who have preserved in their writings the tradition of the church: thus St. Chrysostom and St. Basil are called Greek fathers, and St. Augustine and St. Ambrose, Latin fathers. No author who wrote later than the twelfth century is dignified with the title of *father*.

Fat, in anatomy, an oily matter, secreted from the blood, and filling up the cavities of the adipose cells. The uses of fat are, 1. To serve as a kind of covering to the body, in order to preserve it from cold and other injuries. 2. To defend the more tender and sensible parts from being too strongly irritated by the salts. 3. To preserve in good order the pliancy of the muscles, of the skin, and of the other parts between and about which it is placed. 4. To facilitate the motions of certain parts; as the eyes and jaws. 5. To fill up empty intersticial spaces, and by that means to add to symmetry and beauty; as is evident in the face and the neck. 6. To prevent the painful pressure and attrition of the parts, particularly in the soles of

the feet, the nates, and other like parts; in all which the fat is copiously disposed, and serves in the place of a cushion for the muscular flesh to rest upon. 7. There is great reason to suppose, that when the body does not receive nourishment in the usual way, the regress of the fat into the veins supplies that defect.

Fealty, in law, an oath taken on the admittance of any tenant, to be true to the lord of whom he holds his land.

This fealty, at the first creation of it, bound the tenant to fidelity, the breach of which was the loss of his fee. It has been divided into general and special: general, that which is to be performed by every subject to his prince; and special, required only of such as, in respect of their fee, are tied by oath to their lords.

Feast, in the English Church, a word principally used in proceedings at law: thus, the four quarterly feasts, or stated times, whereon rent on leases is usually reserved to be paid, are Lady-day, or the annunciation of the blessed virgin Mary, or 25th of March; the nativity of St. John the Baptist, held on the 24th of June; the feast of St. Michael the arch-angel, on the 29th of September; and Christmas, or rather of St. Thomas the apostle, on the 21st of December.

Feasts, *moveable*, are those which, depending on astronomical calculations, do not always return on the same days of the year. Of these, the principal is Easter, which fixes all the rest as Palm-Sunday, Good-Friday, Ash-Wednesday, Sexagesima, Ascension-day, Pentecost, and Trinity-Sunday. See Easter.

Feasts, *immoveable*, those which are constantly celebrated on the same day: of these, the principal are Christmas-day, or the Nativity; the Circumcision; Epiphany; Candlemas, or the Purification; Lady-day, or the Annunciation, All-Saints, and All-Souls, and the days of the several apostles.

Feather, in physiology, a general name for the covering of birds; it being common to all the animals of this class to have their whole body, or at least the greatest part of it, covered with feathers or plumage.

Feathers make a considerable article in commerce, particularly those of the ostrich, heron, swan, peacock, turkey, goose, and duck.

They may be considered as of four kinds: 1. quills, or the feathers of the wings; 2. those which cover the body; 3. the down which grows close to the skin; and, 4. the long ones of the tail.

Of the first description, the goose, the turkey, and the crow, supply those usually employed in writing. The feathers of the common poultry are used for beds; and the down of the swan is sometimes made into muffs and other articles of dress. The eider-duck, the down of which is celebrated, is a native of the high northern latitudes: a considerable number breed in the west of Scotland, and supply the inhabitants with a profitable branch of trade; but the larger part of the down used in Britain is brought from Denmark.

February, in chronology, the second month of the year, reckoning from January, first added to the calendar of Romulus by Numa Pompilius. February derived its name from Februa, a feast held by the Romans in this month, in behalf of the

manes of the deceased, at which ceremony sacrifices were performed, and the last offices were paid to the shade of the defunct. This month in a common year, consists only of twenty-eight days, but in the bissextile year it has twenty-nine, on account of the intercalary day added that year.

Fee-estate, that held of another, and for which some service, rent, or acknowledgment is paid to the chief lord, or superior, in whom the ultimate propriety of the soil always continues. Fee is generally divided into absolute and conditional. Absolute, otherwise termed fee-simple, is where a person is seized of lands or tenements, to him and to his heirs for ever; whereas, fee-tail, or conditional fee, is where a person is seized of lands, with a limitation to him and the heirs of his body. A fee-simple is the most complete estate a person can have, and can be conveyed by no other expression but that of *heirs for ever;* yet, in a will, which is more favoured than a grant, the intention of the testator is more considered than the literal meaning of the words.

Feeling, one of the five external senses, by which we obtain the ideas of solid, hard, soft, rough, hot, cold, wet, dry, and other tangible qualities. This sense is the coarsest, but at the same time the surest of all others: it is besides the most universal. We see and hear with small portions of our body; but we feel with all. Nature has bestowed that general sensation wherever there are nerves, and they are every where, where there is life. Were it otherwise, the parts divested of it might be destroyed without our knowledge. It seems that upon this account nature has pro-

vided, that this sensation should not require a particular organization. The structure of the nervous papillæ is not absolutely necessary to it. The lips of a fresh wound, the periosteum, and the tendons, when uncovered, are extremely sensible without them. These nervous extremities serve only to the perfection of feeling, and to diversify sensation.

Feeling is the basis of all other sensations. All the nervous solids, while animated by their fluids, have this general sensation; but the papillæ in the skin, those of the fingers in particular, have it in a more exquisite degree, so perfectly, that they convey some notice of the figure of the bodies which they touch. The object of feeling is every body that has consistency or solidity enough to move the surface of our skin. It was necessary to perfect feeling, that the nerves should form small eminences, because they are more easily moved by the impression of bodies, than an uniform surface. It is by means of this structure, that we are enabled to distinguish not only the size and figure of bodies, their hardness and softness, but also their heat and cold. Feeling is so useful a sensation, that it supplies the office of the eyes, and in some sense indemnifies their loss.

Felis, in natural history, a genus of the order feræ. This tribe is temperate in its habits; climbs trees; sees best by night, and when falling from a height lights on the feet: waves the tail when in sight of prey, refuses vegetable food except from necessity: it includes the Lion, Tyger, Cat, Panther, &c. The Lion inhabits Africa: more rarely the deserts of Persia, India, Japan. It preys on

horses and other larger quadrupeds, and when pressed by severe hunger, on man; afraid of flame; restrained by dogs; when young is easily tamed; roars terribly; sleeps in the sun; eats every day; lazy, slow; leaps upon its prey; breath fetid; smell weak. Its flesh is eaten by the Africans. The strength of the lion is prodigious; he is able to break the back of a horse by a single stroke of his paw; to carry off with ease a middle-sized ox or a buffalo; and to break the bones with his teeth with perfect ease and swallow them with the flesh. His duration is uncertain. Buffon calculates it under thirty years; but we have had lions in a state of confinement in the Tower who have lived sixty or seventy years. The Felis Tigris or Tyger inhabits the warmer parts of Asia, as China, Japan, and India, lives in woods and thickets near rivers: it is cunning, cruel, strong, and of vast swiftness, infesting and even desolating the human race. When tamed from its birth, it will exercise his ferosity as soon as liberated: the male destroys his own progeny; will at all times attack the lion, and is the most beautiful of all wild beasts. See pl. Nat. Hist. Fig. 18, 19.

Fellowship, in arithmetic, is when two or more join their stocks and trade together, dividing their gain or loss proportionably. Fellowship is either with or without time. Fellowship without time is worked by the following rule "As the whole stock, to the whole gain or loss, so is each man's particular stock to his share of gain and loss."

Example. Suppose three persons A, B, and C trade together, and A put in 240*l.* B 320*l.*

and C 400*l.* and they gain 120*l.* what is each man's profit. Say as the whole stock, or

| £ | £ | £ | £ |
|---|---|---|---|
| 960 : | 120 : : | 240 : | 30=A's share. |
| 960 : | 120 : : | 320 : | 40=B's share. |
| 960 : | 120 : : | 400 : | 50=C's share. |

£. 120—whole gains.

FELO DE-SE, in law, a person that deliberately lays violent hands on himself, and is the occasion of his untimely death, whether by hanging, drowning, stabbing, shooting or any other way. This is a species of felony, of which infants, ideots, lunatics, and persons distracted by a disease, cannot be guilty, it being the wilful and deliberate perpetration of self-murder that constitutes this crime. The goods and chattels, both real and personal, of a *felo-de-se*, are forfeited to the king: however, the jury frequently save the forfeiture, by finding their verdict lunacy; to which they are inclined on a favourable interpretation, that it is impossible for a person in his senses to do a thing so contrary to nature.

FELONY, in law a capital crime, next in degree to petit-treason, and committed with an evil intention. Felony is either by the common law, the civil law, or by statute. Felony at common law, is either against the life of a person, as murder, manslaughter, felo-de-se, and se-defendendo; against his goods, as larceny, and robbery; against his habitation, as burglary, arson, and house-breaking; or, lastly, against public justice, by breach of prison, rescue, and escape, &c. Piracy, and robbery and

murder on the sea, is felony both by the civil law, and by statute.

There are usually reckoned two sorts of felony, one lighter, and such as for the first offence may be allowed benefit of clergy; which the other, or greater may not. See BENEFIT and CLERGY.

Felony is punishable with loss of life, and of lands not intailed, as also of goods and chattels. It also corrupts blood, unless the statute, making an offence to be felony, ordains it otherwise.

FELTING, the method of working up hair, or wool into a species of cloth, independently of either spinning or weaving. A hatter separates the hairs from each other by striking the wool with the string of his bow, causing them to spring up in the air, which fall on the table in every direction, which is covered by the workman with cloth, pressing it with his hands, and moving the hairs backwards and forwards in different directions. In this manner the hairs are brought against each other, and their points of contact considerably multiplied, and the agitation gives each hair a progressive motion towards the root, in consequence of which the hairs become twisted together. As the mass becomes compact, the pressure should be increased, in order to keep up the progressive motion and twisting of the hairs, which is then performed with greater difficulty. The hair intended for the manufacturing of hats is always cut off with a sharp instrument, and not pulled out by the roots, because the bulb of the hair, which would come out with it in the latter case, would render the end which was fixed in the skin very obtuse, and nearly destroy its disposition to unite with the adjacent hairs. The

hairs should not be straight like needles, for then there would be no compactness in the stuff. The fibres of wool having naturally a crooked form, that substance is well adapted to the operation of felting. The hair of beavers, rabbits, hares, &c. being straight, cannot be used in felting, till it has been prepared for the purpose.

FELUCCA, in nautical affairs, a little vessel with six oars, frequent in the Mediterranean, which has this peculiarity, that its helm may by applied either to the head or stern, as occasion requires.

FENCING, the art of making a proper use of the sword, as well for attacking an enemy, as for defending one's self. Fencing is either simple or compound. Simple is that performed nimbly and off hand, on the same line. In this the principal intention, in respect to the offensive part, should be to attack the enemy in the most unguarded part; and in the defensive, to parry or ward off the enemy's thrusts and blows. Compound fencing, on the offensive part, includes all manner of arts to deceive the enemy, by making him leave the part unguarded which we want to attack; such are feints, appeals, clashing and intangling of swords, half-thrusts, &c. and on the defensive, to parry and thrust at the same time.

FEODAL, or FEUDAL SYSTEM, a form of government antiently subsisting in Europe; which still forms the basis of modern customs, and with which every Briton, who would understand the history of his country, the origin of its political constitution, the tenure of its landed property, and the general basis of its polity, should make himself acquainted.

The word *feod*, is thus derived: We are informed

by Pontoppidan, that *odh*, in the Northern languages, is the same with *proprietas*, and *all* with *totum* in the Latin; whence the word *odhall* signifies *right*. By transposing these two syllables the word *allodh* is formed, from which comes *allodium*, or the *absolute* property claimed by the holders of fiefs or feods; and by the combination of *odh*, signifying *property*, with the word *fee*, signifying *a conditional stipend or reward*, is produced the word *feodh*, "a property given by way of stipend or reward upon certain conditions."

With respect to the origin of this system, we are told that it is to be found in the military policy of the *Celtic* or northern nations, known by the names of *Goths*, *Vandals*, *Franks*, *Hunns*, and *Lombards*, who overran Europe on the declension of the Roman Empire, and brought it with them from the countries out of which they emigrated.

According to the feodal scheme, a victorious leader allotted considerable portions of land, called *feoda*, *fiefs*, *fees*, or *feuds*, to his principal officers, who in their turn, divided their possessions among their inferiors. The condition upon which these rewards were given was, that of faithful military service both at home and abroad. This the receiver bound himself by the oath of fealty to perform, and in the event of a breach of that oath, the lands returned to the donor.

Such was the foundation of a system of government the most brilliant in theory that it is possible to conceive; and one that in the times, and under the circumstances, of its erection, was it is reasonable to believe, not only the most expedient, but the most desirable to all parties. It laid down a gra-

duated scale from the lowest vassal to the prince or lord paramount of the territory; every man's interest was involved in the security of the whole; and every man was a pledge of security to his neighbour. In the midst of that disinterestedness of sentiment which belongs to a rude state of society, the connection of the lord and his vassal was of the most admirable nature; and, as is the end of all social combinations, each individual contributed to support that strength by which he was protected. It was in these days that those *feodal incidents*, or as they have since been termed, *rights*, originated, which in subsequent times, became notoriously oppressive.

The expectants of fiefs, while the tenures were precarious, or for life only, were educated in the hall of the superior; and even when they became hereditary, the lord took care of the son and estate of his deceased vassal: not only protecting his person, but taking charge of his tuition, and directing the management of his affairs. This was called the incident of *wardship*.

The incident of *relief* was founded upon the gratitude, or at most the voluntary offering, of the vassal, who, on receiving his fief, brought a present to his lord, as an acknowledgment of the favours experienced, and with a view to the conciliation of his future regard.

The incident of *marriage* was also of the same patriarchal nature. The vassal forebore to ally himself with a family inimical to his chief, and the chief sought the most advantageous match for his vassal.

It sometimes happened, through war, or other

accidents, that the chief himself was reduced to poverty: but from whatever cause his distress proceeded, whether from his extravagance or prodigality, his vassals were bound to support and relieve him according to their means; and this was called the incident of *aid*.

The incident of *escheat* took place on the part of the vassal, when, through cowardice, treachery, or other misconduct, he rendered himself unworthy of his fief; when the taking it from such a one, and giving it to another more deserving, was called an *escheat*.

Without having lived in the days to which we are now looking back, a very small portion of the knowledge of human nature will be sufficient to convince us that the theory itself, as a permanent institution, however fair-seeming, is hollow; that the family connection it supposes could be but a source of minute, domestic tyranny; and that in their best period, the customs enumerated must have been liable to the grossest abuse. In process of time, the evil increased to an enormous height; and even the political value of the system decayed. In its vigour, it had at least constituted a regular, powerful, and compact system of government; a unanimity had pervaded the various departments of the state; and while the power was internally diffused, it presented to foreign nations a united and formidable front. As the ideas engendered by property advanced, and the great grew more avaricious of money than of glory; and when, it ought perhaps to be added, man's notions of right and order became more correct, nothing was heard of but the enormities of the powerful, and the sufferings of

the weak. In this situation of things, the form of the system indeed remained; but its spirit was gone: the vassals still followed their chiefs to the field, because by neglecting to do so they had forfeited their lands; but when there, they as often contributed to his overthrow as to his advantage.

The feodal governments, therefore, once so strong, were now weak and unmanageable; and, in remedy, *knight-service* was introduced. This event happened about the year 800; and from that epoch is to be dated the extinction of the feodal system in its pure and unmixed character: it was blended, however, with the system of knight-service, as both the one and the other, in after times, gave birth to, and blended themselves with, the British parliament.

The conqueror divided England into 60,215 fiefs, all held of the crown; and the possessors of which were to take up arms and repair to his standard on the first signal.

FERÆ, in natural history, an order of quadrupeds, of which the distinguishing characteristics are that they usually have six conic fore-teeth in each jaw; long tusks, and grinders with conical projections: they feed on carcases, and prey on other animals. This order comprehends the canis, the felis, the ursus, and seven other genera.

FERÆ NATURÆ, in law, signifies beasts and birds that are wild, as foxes, hares, and wild-ducks, in which no person can claim any property.

FERMENTATION. The word fermentation, in general, is used to denote that change in the principles of organic bodies which begins to take place spontaneously as soon as their vital functions have

ceased, and by them are at length reduced to their first principles. This has been distinguished into three stages, the vinous or spirituous, the acid or acetous, and the putrid fermentation. It is ascertained almost beyond doubt, that the vinous fermentation takes place only in such bodies as contain saccharine juices. In this the most remarkable product is a volatile, colourless, slight inflammable fluid, which mixes with water in all proportions, and is called alcohol, which see. The acetous fermentation is distinguished by the product known by the name of vinegar, which is the least destructible of the vegetable acids. It does not appear, however, that fermentation is absolutely necessary for the production of this acid, as there are many other chemical processes by which it may be obtained or produced. In the putrid fermentation, bodies appear to be reduced into their most simple parts. Ammonia is the product which has been remarked as the chief of this process, and is no doubt produced by the combination of the hydrogen and nitrogen gasses, which are disengaged together. See AMMONIA.

FIBRIN. If a quantity of blood, newly drawn from an animal, be allowed to remain at rest for some time, a thick red clot gradually forms in it, and subsides. Separate this clot from the rest of the blood, put it into a linen cloth, and wash it repeatedly in water till it ceases to give out any colour or taste to the liquid; the substance which remains after this process is denominated fibrin. It has been long known to physicians under the name of the fibrous part of the blood; but has not till

lately been accurately described. It may be procured also from the muscles or flesh of animals.

FIERI FACIAS, in law, a writ that lies where a person has recovered judgment for debt or damages in the king's courts against one, by which the sheriff is commanded to levy the debt and damages on the defendant's goods and chattels. This writ must be sued out within a year and a day after the judgment obtained.

FIFTEENTH, an ancient tribute or tax laid upon cities, boroughs, &c. through all England, and so termed because it amounted to a fifteenth part of what each city or town had been valued at; or it was a fifteenth of every man's personal estate according to a reasonable valuation. In doomsday-book, there are certain rates mentioned for levying this tribute yearly.

FIG, the fruit of the fig-tree, the best of which is produced in Italy, Spain, and Provence. The islands of the Archipelago have figs in great abundance, but of inferior quality. See CAPRIFICATION.

FIGURE, in rhetoric, is a manner of speaking different from the ordinary and plain way, and more emphatical; expressing a passion, or containing a beauty. Figures are highly serviceable to clear difficult truths, to make a style pleasant and pathetical, and to awaken and fix attention; but as, in order to obtain these ends, they are to be used with prudence and caution, the following directions ought to be observed. 1. Let the discourse always be founded on nature and sense, supported with strong reason and proof, and then add the ornaments and heightenings of figures; for a man of clear understanding will despise the flourish of figures without

sense, and pomp of words that wants truth and substance of things. 2. Be sparing in the use of figures. A passion described in a multitude of words, and carried on to a disproportionate length, fails of the end proposed, and tires instead of pleasing. 3. Figures must not be over adorned, nor affectedly laboured, and ranged into new and scrupulous periods; for by affectation and show of art, the orator betrays and exposes himself, and it is apparent, that he is rather ambitious to set off his parts and wit, than to express his sincere concern and passion.

Filament, in natural history, a fibre or fine thread in flesh, nerves, skin, plants, and roots, and other substances. Putrefaction destroys the pulpy or fleshy matter, and leaves the tough filaments entire: thus, by putrifying the leaf of a plant in water, the fibres, which constitute the basis of the ribs and minute veins, are obtained complete. Alkaline lixivia in some degree operate in a manner similar to putrefaction. Vegetable filaments are the materials of many manufactures. In Britain, the filamentous parts of hemp, flax, and cotton are worked into cloths; in Madagascar, slight cloths of a softness approaching to silk, and others of a coarser and very durable texture, as well as sail-cloth and cordage, are made from the bark of certain species of trees. In France, the filaments of nettles are applied to the same variety of purposes; and it has been suggested that the muslins and calicoes of India are made from the same plant. In Sweden, a strong cloth is said to be made of the stalk of the hop. In Otaheite, cloth is made from the bark of trees.

FILARIA, a genus of the class vermes, and order intestina: the most destructive is the Filaria medinensis, or Guinea-worm; which inhabits both Indies, and is frequent in the morning dew, whence it enters the naked feet of the slaves, and creates the most troublesome itching, accompanied with inflamation and fever. It is frequently from eight to ten feet in length, and not larger than a horse-hair,

FILAZAR, or FILACER, an officer of the common-pleas, so called from his filing those writs whereon he makes out processes. There are fourteen of these officers, who are severally allotted to particular divisions and counties, and make out all writs and processes upon original writs, issuing out of the court of chancery, and returnable in that court.

FILLAGREE-*work*, a delicate and elaborate manufacture, primarily executed in threads of gold and silver, but lately imitated with coloured and gilt paper. There is no manufacture in any part of the world that has been more admired and celebrated than the fillagree of Sumatra, of which a minute history is given in Marsden's account of that island. The work usually executed by young ladies in this country under the title of fillagree, and of which caddies, vases, &c. are constructed, is formed of narrow slips of coloured paper, or gilt at the edges, and curiously rolled up and glued in various fanciful forms. The Chinese also make fillagree mostly of silver, which looks elegant, but wants likewise the extraordinary delicacy of the Malay work. The price of the workmanship depends upon the difficulty or uncommonness of the pattern. In some articles of usual demand, it does not exceed

one third of the value of the gold; but in matters of fancy, it is generally equal to it.

Files, *manufactory of.* Many useful tools have been invented for performing mechanical operations, which consist of a number of wedges or teeth, which may be conceived to stand upon, or rise out of a flat or curved metallic surface. When these teeth are formed upon the edge of a plate, the instrument is called a saw; but when they are formed upon a broad surface, it constitutes what is known by the name of a file. The comb-makers and others use a tool of this description, called a quonet, having coarse single teeth, to the number of about seven or eight in an inch. Fine tools of the same kind, namely, with single teeth, are called floats. When the teeth are crossed, they are called files; and when instead of the notches standing in a right line, a number of single individual teeth are raised all over the surface, it is called a rasp.

Filter, in chemistry, a strainer commonly made of bibulous or filtering paper in the form of a funnel, through which any fluid is passed, in order to separate the gross particles from it, and render it limpid. There are several filters made of flannel and linen cloth. The filter produces the same effect, with regard to liquids, that the sieve does in dry matters. Filters are of two sorts: the first are simple pieces of paper or cloth, through which the liquor is passed without farther trouble; the second are twisted up like a skein or wick, and first wetted, and then squeezed as dry as possible; one end is put into the liquor to be filtrated, the other end is to hang out below the surface of the liquor; by this

means the purest part of the liquor distils drop by drop out of the vessel, leaving the dregs behind; a filter of this kind acts upon the principle of the syphon. Water is freed from various impurities by means of basins made of porous stone; this is often very necessary at sea, when the water becomes foul, and on land, where there are no fresh springs. The filter is of use to all those in and near the metropolis, who are supplied with water from the Thames, the New River, and the ponds from Hampstead. Many patents have been obtained for filtering machines, which may be seen in various parts of London.

Finances, in political economy, denote the revenue of a king or state. In former times, when the whole revenue drawn from the people, by a few taxes, was considered as the personal property of the sovereign, the purposes to which it was applied, depended on his discretion, or that of his minister. As few princes were inclined, in times of peace, to provide for the extraordinary charges of a state of warfare, these were defrayed by extraordinary contributions from the people, which ceased with the occasion. Few sovereigns possessed sufficient credit, either with their own subjects or foreigners, to contract debts, so that at the conclusion of a war, there was no occasion for a greater expenditure than before its commencement, and the revenue drawn from the people reverted to its former state. It is the system of defraying extraordinary expences by borrowing the money, for which an annual interest must be paid; and of suffering the debts thus incurred to accumulate, by which the sum to be annually paid is continually increasing,

and the expences of every war are rendered far greater than those which preceded it, that has swelled the revenue and expenditure of most of the nations of Europe to an enormous magnitude, and caused their system of finance to become complicated and oppressive.

In Great Britain, where the system of running in debt, or, as it is commonly termed, the funding system, has been carried to a greater height than in any other country, its natural attendants, enormous taxation and expenditure, have made equal progress; and it is probably owing chiefly to the publicity which is given to all matters of finance, so that every person, with little trouble, may know how all the money raised for the public service is expended, that the people have been induced to submit to taxes, which both from their nature and amount would have appeared incredible to their forefathers.

The English system of finance rests on the produce of the various taxes which have been imposed at different periods, the aggregate amount of which, after deducting the expences of collection, together with a few small articles which cannot properly be called taxes, forms the whole of the public income: this income is annually appropriated to the several branches of the national expenditure, and when, in consequence of any extraordinary expences, it is known that the income of the current year will be insufficient to meet all the demands upon it, it is usual to borrow the sum necessary to make up the deficiency, either from individuals or public bodies, and to allow a fixed rate of interest on the money thus obtained, till the principal shall be repaid, or

till the period originally agreed upon shall have expired.

Fine, in law, a term that has several significations. Sometimes it means a sum of money advanced and paid for the income of lands; at others, a sum paid as an amends, or by way of punishment, for an offence committed.

Fine also denotes a covenant, made before justices, and entered upon record, for conveyances of lands and other inheritable things, in order to cut off all controversies. As this fine is a concord acknowledged before a competent judge concerning lands, tenements, and other immoveable things, and for its better credit, is supposed (as levied in his court) to be made in the presence of the king, it binds women covert, who are parties, and others whom the law generally disables to act: because all presumption of deceit is excluded, where the king and his court of justice are privy to the matter transacted. Fines on account of their solemnity, are acknowledged in the court of common-pleas. Justices of assise may also take them, though they seldom do it without a special writ, by virtue of which fines may be also taken by commissioners in the country, under the surmise that the parties are not able to travel to Westminster: for, by the common law, all fines are levied in court.

Fingers, in anatomy, the extreme part of the hand divided into five members. The names of the fingers, reckoning from the thumb, are, 1. *pollex*, 2. *index*, 3. *medius*, 4. *annularis*, 5. *auricularis*. In each of these there are three bones, which make three phalanges, the upper of which are much larger than the lower. Their exterior surface is

convex, and their interior plane, but somewhat hollowed, for the convenience of grasping.

FIRE. See CALORIC.

The properties of caloric are four in number: 1. it causes *expansion;* 2. it causes *fluidity;* 3. it causes *evaporation;* 4. it causes *combustion.*

1. When caloric enters into the pores of bodies, that is, when, according to the usual expression, bodies become hot, they expand in every direction in a degree proportionate to the quantity of caloric they contain.

Different bodies, however, expand in different proportions; that is, their fitness, to imbibe caloric is different. This part of the subject belongs to the *attraction of combination;* according to which theory bodies are said to have more or less *affinity* for caloric.

2. The second effect of the presence of caloric is that of rendering solid bodies fluid. Ice is the state of water while it contains only a very small portion of caloric; but the particles of this body have so strong an affinity or attraction for caloric, that it is perpetually ready to become fluid by the accession of that body. The phenomena of expansion and fluidity result from the same operation of caloric; that of entering into the pores of bodies, separating their particles, and, by the addition of its own bulk, necessarily increasing their's.

3. As by the application of heat or fire solid bodies are expanded; so by a continuation and increase of it their particles are dissolved and rendered fluid: and if heat continue to be accumulated, what was before a common or incompressible fluid, will become an elastic fluid. In common language,

it will *boil*, and in process of time dissipate in vapour.

4. Combustion, or the act of *consuming*, implies the emission of fire from some body in which it existed in a latent state, and the destruction, or rather change of some other body. Fire is contained in the largest quantity in air: and the pure part of it, that is, *oxygen*, being disposed to unite with many other matters, most of the ordinary processes of combustion and inflammation are the result of the sudden union of oxygen with some other substance, in which case the fire which was contained in the oxygen of the air is disengaged and let loose.

Fire-*ship*, in the navy, a vessel charged with artificial fire-works, which, having the wind of an enemy's ship, grapples her, and sets her on fire.

Firmament, in the Ptolemaic astronomy, the eighth heaven or sphere, with respect to the seven spheres of the planets which it surrounds. It is supposed to have two motions; a diurnal motion, given to it by the *primum mobile*, from east to west about the poles of the ecliptic; and another opposite motion from west to east, which last it finishes, according to Tycho, in 25,412 years; according to Ptolemy, in 36,000; and according to Copernicus, in 25,800; in which time the fixed stars return to the same points in which they were at the beginning. This period is commonly called the Platonic year, or the great year.

First-fruits, in the church of England, are the profits of every spiritual benefice for the first year, according to the valuation thereof in the king's books.

Fisc, in the civil law, the treasury of a prince.

It differs from the ærarium, which was the treasury of the public or people: thus, when the money arising from the sale of condemned persons' goods, was appropriated for the use of the public, their goods were said to be *publicari;* but when it was destined for the support of the prince, they were called *confiscari.*

Fish, in natural history, constitutes a class of animals which have no feet, but always fins; add to this, that their body is either altogether naked or only covered with scales; and that they are aquatic animals, which live mostly, if not always, in water. See Ichthyology.

Fishes, in heraldry, are the emblems of silence and watchfulness, and are borne either upright, imbowed, extended, endorsed, respecting each other, surmounting one another, fretted.

Fishery, a place where fish are caught in great abundance. The principal fisheries for salmon, herring, mackrel, pilchards, &c. are along the coasts of England, Scotland, and Ireland; for cod, on the banks of Newfoundland; for whales, about Greenland; and for pearls, in the East and West Indies.

Fishery denotes also the commerce of fish, more particularly the catching them for sale.

Fishery, *Anchovy.* Anchovies are fished for on the coast of Provence, in the months of May, June, and July, at which season shoals of this fish regularly come into the Mediterranean through the straits of Gibraltar. They are likewise found in plenty in the river of Genoa, on the coast of Sicily, and on that of the island of Gorgone opposite to Leghorn; these last are reckoned the best. An-

chovies are seldom fished for but in the night time. If a fire be kindled on the poops of the vessels used for this fishing, the anchovies will come in greater numbers into the nets; but then it is asserted, that the anchovies taken thus by fire, are neither so good nor so firm, and will not keep so well, as those which are taken without fire. When the fishery is over, they pull off the heads of all the anchovies, gut them, and afterwards range them in barrels of different weights, the largest of which do not weigh above 25 or 26 pounds, and they put a good deal of salt in them. Some also pickle them in small earthen pots made on purpose, of two or three pounds weight, more or less, which they cover with plaster to keep them the better.

Fishery, *Cod.* There are two kinds of cod-fish, the one green or white cod, and the other dried or cured cod, though both are the same fish differently prepared, the former being sometimes salted and barrelled, then taken out for use, and the latter having lain some competent time in salt, dried in the sun or smoke. We shall therefore speak of each of these apart; and first of the

Fishery, *Green cod.* The chief fisheries for green cod are in the bay of Canada, on the great bank of Newfoundland, on the isle of St. Petre, and the isle of Sable, to which places vessels resort from divers parts both of Europe and America. The most essential part of the fishery, is to have a master who knows how to cut up the cod, one who is skilled to take the head off properly, and, above all, a good salter, on which the preserving them, and consequently the success of the voyage, depends. The best season is from the beginning of

February to the end of April; the fish, which in the winter retire to the deepest water, coming then on the banks, and fattening extremely. What is caught from March to June keeps well, but those taken in July, August, and September, when it is warm on the banks, are apt to spoil soon. Every fisher takes but one at a time: the most expert will take from 350 to 400 in a day; but that is the most, the weight of the fish, and the great coldness on the bank, fatiguing very much. As soon as the cod are taken, the head is taken off; they are opened, gutted and salted, and the salter stows them in the bottom of the hold, head to tail, in beds a fathom or two square; laying layers of salt and fish alternately, but never mixing fish caught on different days. When they have lain thus three or four days to drain off the water, they are replaced in another part of the ship, and salted again; where they remain till the vessel is loaded. Sometimes they are cut in thick pieces, and put up in barrels for the conveniency of carriage.

Fishery, *dry cod.* The principal fishery for dry cod, is from cape Rose to the bay des Exports, along the coast of Placentia, in which compass there are divers commodious ports for the fish to be dried in. These, though of the same kind with the fresh cod, are much smaller, and therefore fitter to keep, as the salt penetrates more easily into them. The fishery of both is much alike, only this latter is more expensive, as it takes up more time, and employs more hands, and yet scarce half so much salt is spent in this as in the other. The bait is herrings, of which great quantities are taken on the coast of Placentia. When several vessels

meet and intend to fish in the same port, he whose shalloop first touches ground, becomes intitled to the quality and privileges of admiral: he has the choice of his station, and the refusal of all the wood on the coast at his arrival. As fast as the masters arrive, they unrig all their vessels, leaving nothing but the shrouds to sustain the masts, and in the mean time the mates provide a tent on shore, covered with branches of trees, and sails over them, with a scaffold of great trunks of pines, twelve, fifteen, sixteen, and often twenty feet high, commonly from forty to sixty feet long, and about one third as much in breadth. While the scaffold is preparing, the crew are fishing, and as fast as they catch they bring their fish ashore; open and salt them upon moveable benches; but the main salting is performed on the scaffold. When the fish have taken salt, they wash and hang them to drain on rails; when drained, they are laid on kinds of stages, which are small pieces of wood laid across, and covered with branches of trees having the leaves stripped off, for the passage of the air. On these stages they are disposed, a fish thick, head against tail, with the back uppermost, and are turned carefully, four times every twenty-four hours. When they begin to dry, they are laid in heaps ten or twelve thick, in order to retain their warmth; and every day the heaps are enlarged, till they become double their bulk; and then two heaps are joined together, which they turn every day as before; lastly, they are salted again, beginning with those first salted, and being laid in huge piles, they remain in that situation till they are carried on board the ships, where they are laid

on the branches of trees disposed for that purpose, upon the ballast, and round the ship, with mats to prevent their contracting any moisture.

There are four kinds of commodities drawn from cod, viz. the sounds, the tongues, the roes, and the oil extracted from the liver. The first is salted at the fishery, together with the fish, and put up in barrels of from 6 to 700 pounds. The tongues are done in like manner, and brought in barrels from 4 to 500 pounds. The roes are also salted in barrels, and serve to cast into the sea to draw fish together, and particularly pilchards. The oil comes in barrels, from 400 to 520 pounds, and is used in dressing leather. The Scots catch a small kind of cod on the coast of Buchan, and all along the Murray Firth on both sides; as also in the Firth of Forth, Clyde, &c. which is much esteemed. They salt and dry them in the sun upon rocks, and sometimes in the chimney. They also cure skait, and other small fish in the same manner, but most of these are for home-consumption.

FISHERY, *Herring*. Herrings are chiefly found in the North Sea. They are a fish of passage, and commonly go in shoals, being very fond of following fire or light, and in their passage they resemble a kind of lightning. About the beginning of June, an incredible shoal of herrings, probably much larger than the land of Great Britain and Ireland, come from the north on the surface of the sea: their approach is known by the hovering of sea-fowl in expectation of prey, and by the smoothness of the water.

FISHERY, *Mackrel*. The mackrel are found in large shoals in the ocean, but especially on the

French and English coasts. They enter the English channel in April, and proceeding as the summer advances; about June, they are on the coasts of Cornwall, Sussex, Normandy, Picardy, &c. where the fishery is most considerable. They are taken either with a line or nets: the latter is preferable; and is usually performed in the night-time. They are pickled two ways, first by opening and gutting them, and cramming their bellies as hard as possible with salt, by means of a stick, and then laying them in rows at the bottom of the vessel, strewing salt between each layer. The second way is putting them directly into tubs full of brine, made of salt and fresh water, and leaving them to steep till they have taken salt enough to keep. After this, they are barrelled up and pressed close down.

FISHERY, *Pilchard.* The chief pilchard fisheries are along the coasts of Dalmatia, on the coast of Bretagne, and along the coasts of Cornwall and Devonshire. That of Dalmatia is very plentiful: that on the coasts of Bretagne employs annually about 300 ships. The pilchards caught on our coasts, though bigger, are not so much valued as those on the coasts of France, owing principally to their not being so thoroughly cured. They naturally follow the light, which contributes much to the facility of the fishery: the season is from June to September. On the coasts of France they make use of the roes of the cod-fish, as a bait, which thrown into the sea makes them rise from the bottom, and run into the nets. On our coasts there are persons posted ashore, who, spying by the colour of the water where the shoals are, make signs to the boats to go among them to cast their nets. When taken, they

are brought on shore to a warehouse, where they are laid up in broad piles, supported with backs and sides; and as they are piled, they salt them with bay salt, in which lying to soak twenty or thirty days, they run out a deal of blood, with dirty pickle and bittern: then they wash them clean in sea-water, and when dry, barrel and press them hard down to squeeze out the oil, which issues out at a hole in the bottom of the cask. The Cornish men observe of the pilchard, that it is the least fish in size, most in number, and greatest for gain, of any they take out of the sea.

FISHERY, *Salmon*. The chief salmon fisheries in Europe are in England, Scotland, and Ireland, in the rivers, and sea-coasts adjoining to the river mouths. Those most distinguished for salmon in Scotland, are the river Tweed, the Clyde, the Tay, the Dee, the Don, the Spey, the Ness, the Bewley, &c. in most of which it is very common about the height of summer, especially if the weather happen to be very hot, to catch four or five score of salmon at a draught. The chief rivers in England for salmon are the Tyne, the Trent, the Severn, and the Thames. The fishing usually begins about January, and in Scotland they are obliged to cease about the 15th of August, because, as it is then supposed the fish come up to spawn, it would be depopulating the rivers to continue fishing any longer. It is performed with nets, and sometimes with a kind of locks or wears made on purpose, which in certain places have iron or wooden grates so disposed, in an angle, that being impelled by any force in a contrary direction to the course of the river, they may give way and open a little

at the point of contact, and immediately shut again, closing the angle. The salmon, therefore, coming up into the rivers, are admitted into these grates, which open, and suffer them to pass through, but shut again, and prevent their return. Salmon are also caught with a spear, which they dart into them, when they see them swimming near the surface of the water. It is customary likewise to catch them with a candle and lanthorn, or wisp of straw set on fire; for the fish naturally following the light, are struck with the spear, or taken in a net spread for that purpose, and lifted with a sudden jerk from the bottom. When the salmon are taken, the method of curing is this, they open them along the back, take out the entrails and gills and cut out the greatest part of the bones, endeavouring to make the inside as smooth as possible, then salt the fish in large tubs, for the purpose, where they lie a considerable time soaking in brine, and about October they are packed close up in barrels, and sent to London, or exported up the Mediterranean. They have also, in Scotland, a great deal of salmon salted in the common way, which, after soaking in brine a competent time, is well pressed, and then dried in smoke: this is called kipper, and is chiefly made for home consumption, and, if properly cured and prepared, is reckoned very delicious.

Fishery, *Sturgeon.* The greatest sturgeon-fishery is in the mouth of the Volga, on the Caspian Sea, where the Muscovites employ a great number of hands, and catch them in a kind of inclosure formed by large stakes, representing the letter Z, repeated several times. These fisheries are open on the side next the sea, and close on the other

by which means the fish, ascending in its season up the river, is embarrassed in these narrow angular retreats, and so is easily killed with a harping-iron. Sturgeons, when fresh, eat deliciously, and in order to make them keep, they are salted or pickled in large pieces, and put up in cags from thirty to fifty pounds. The great object of this fishery is the roe, of which the Muscovites are extremely fond, and of which is made the caviare or kavia, so much esteemed by the Italians.

Fishery, *Whale.* Whales are chiefly caught in the North sea: the largest sort are found about Greenland, or Spitzbergen. At the first discovery of this country, whales not being used to be disturbed, frequently came into the very bays, and were accordingly killed almost close to the shore, so that the blubber being cut off was immediately boiled into oil on the spot. The ships in those times took in nothing but the pure oil and the fins, and all the business was executed in the country, by which means a ship could bring home the product of many more whales than she can according to the present method of conducting this trade. The fishery also was then so plentiful, that they were obliged sometimes to send other ships to fetch off the oil they had made, the quantity being more than the fishing ships could bring away. Time however, and change of circumstances, have effected that alteration in the concern which in every similar case it is reasonable to expect. The ships coming in such numbers from Holland, Denmark, Hamburg, and other Northern countries, in addition to the English, who were the first discoverers of Greenland, the whales disturbed, and

gradually, as fish often do, forsaking the place, were not to be killed so near the shore as before, but are now found, and have been so ever since, in the openings and spaces among the ice, where they have deep water, and where they go sometimes a great many leagues from the shore.

The whale fishery begins in May, and continues all June and July; and whether the ships have good or bad success, they must come away and get clear of the ice by the end of August; so that in the month of September, at farthest, they may be expected home: but a ship that meets with a fortunate and early fishery in May, may return in June or July.

The manner of taking whales at present is as follows. As soon as the fishermen hear the whale below, they cry out *fall! fall!* and every ship gets out its long-boat, in each of which there are six or seven men: they row till they come pretty near the whale, then the harpooner strikes it with the harpoon. This requires great dexterity, for through the bone of his head there is no striking, but near his spout there is a soft piece of flesh, into which the iron sinks with ease. As soon as he is struck, they take care to give him rope enough; otherwise, when he goes down, as he frequently does, he would inevitably sink the boat: this rope he draws with such violence, that if it were not well watered, it would, by its friction against the sides of the boat, be soon set on fire. The line fastened to the harpoon is six or seven fathoms long, and is called the forerunner: it is made of the finest and softest hemp, that it may slip the easier: to this they join a heap of lines of 90 or 100

fathoms each, and when there are not enough in one long-boat, they borrow from another. The man at the helm observes which way the rope goes, and steers the boat accordingly, that it may run exactly out before; for the whale runs away with the line with so much rapidity, that he would overset the boat, if it were not kept straight. When the whale is stuck, the other long-boats row before, and observe which way the line stands, and sometimes pull it: if they feel it stiff, it is a sign the whale still pulls in strength; but if it hangs loose and the boat lies equally high before and behind upon the water, they pull it in gently, but take care to coil it so, that the whale may have it again easily if he recovers strength: they take care however, not to give him too much line, because he sometimes entangles it about a rock, and pulls out the harpoon. The fat whales do not sink as soon as dead, but the lean ones do, and come up some days afterwards. As long as they see whales, they lose no time in cutting up what they have taken, but keep fishing for others: when they see no more, or have taken enough, they begin with taking off the fat and whiskers in the following manner. The whale being lashed along side, they lay it on one side, and put two ropes, one at the head, and the other in the place of the tail, which together with the fins, is struck off, as soon as he is taken, to keep those extremities above water. On the off side of the whale are two boats to receive the pieces of fat, utensils, and men that might otherwise fall into the water on that side. These precautions being taken, three or four men, with irons at their feet, to prevent slipping, get on the

whale, and begin to cut out pieces of about three feet thick, and eight long, which are hauled up at the capstan or windlass. When the fat is all got off, they cut off the whiskers of the upper jaw with an ax. Before they cut, they are all lashed to keep them firm, which also facilitates the cutting, and prevents them from falling in the sea. When on board, five or six of them are bundled together, and properly stowed, and after all is got off, the carcass is turned adrift, and devoured by the bears, who are very fond of it. In proportion as the large pieces of fat are cut off, the rest of the crew are employed in slicing them smaller, and picking out all the lean. When this is prepared, they stow it under the deck, where it lies till the fat of all the whales is on board; then cutting it still smaller, they put it up in tubs in the hold, cramming them very full and close. Nothing now remains but to sail homewards, where the fat is to be boiled and melted down into train oil.

Besides these fisheries, there are several others both on the coasts of Great Britain and in the North Seas, which, although not much the subject of merchandize, nevertheless employ great numbers both of ships and men; as, 1. The oyster fishing at Colchester, Feversham, the Isle of Wight, in the Swales of the Medway, and in all the creeks between Southampton and Chichester, whence they are carried to be fed in pits about Wevenhoe, and other places.

2. The lobster fishing all along the British channel, the Firth of Edinburgh, on the coast of Northumberland, and on the coast of Norway, whence great quantities are brought to London; and, last-

ly, the fishing of the pot-ash, fin-fish, sea-unicorn, sea-horse, and the seal or dog-fish, all which are found in the same seas with the whales, and yield blubber in a certain degree; besides, the horn of the unicorn is as estimable as ivory, and the skins of the seals are particularly useful to trunk-makers.

Fishing, in general, the art of catching fish, whether by means of nets, or of spears, lines, rods, and hooks. By several statutes it is provided, that no persons shall fish in any pond or moat, without the owner's consent, on pain of three months imprisonment; nor shall any one take fish in a river without licence obtained from the owner, upon forfeiture of 10*s*. to the poor, and triple damages to the party aggrieved, to be levied by justices of the peace, by distress and sale of goods. The nets, and other implements, belonging to poachers, may be seized by the owners of rivers, &c. Fishing performed by a rod, line, and hook, is called angling. See Angling.

Fits of easy reflection, &c. in optics. Sir Isaac Newton calls the successive disposition of a ray to be reflected through different thicknesses of a plate of air, or any other substance, the returns or fits of easy reflection, and the disposition of the same ray to be transmitted in the same manner through the intervening spaces, returns or fits of easy transmission. Thus, a ray of light is in a fit of easy reflection, when it falls on a plate of any kind of matter, whose thickness is one of the terms of the series 1, 3, 5, 7, &c. taking the smallest thickness capable of reflecting such ray for unit; and, in the same way, it is in one of its fits of easy transmission

when the thickness is one of the terms of the series 2, 4, 6, 8, &c. See Optics.

Fixed air. See Carbonic *acid gas.*

Fixed *stars.* See Star.

Flag is more particularly used at sea; for the colours, ancients, standards, &c. borne on the tops of the masts of vessels, to notify the person who commands the ship, of what nation it is, and whether it be equipped for war or trade. The admiral in chief carries his flag on the main-top; the vice-admiral on the fore-top; and the rear-admiral on the mizzen-top. When a council of war is to be held at sea, if it be on board the admiral, they hang a flag in the main-shrouds; if in the vice-admiral, in fore-shrouds; and if in the rear-admiral, in the mizzen-shrouds. Besides the national flag, merchant-ships frequently bear lesser flags on the mizen-mast, with the arms of the city where the master ordinarily resides; and on the fore-mast, with the arms of the place where the person who freights them lives.

Flag, to lower or strike the, is to pull it down upon the cap, or to take it in, out of the respect, or submission, due from all ships or fleets inferior to those any way justly their superiors. To lower or strike the flag in an engagement is a sign of yielding. The way of leading a ship in triumph is to tie the flags to the shrouds, or the gallery, in the hind part of the ship, and let them hang down towards the water, and to tow the vessels by the stern. Livy relates, that this was the way the Romans used those of Carthage.

Flag, to hang out the white, is to ask quarter; or it shows when a vessel is arrived on a coast, that

it has no hostile intention, but comes to trade, or the like. The red flag is a sign of defiance, and battle.

Flag officers, those who command the several squadrons of a fleet; such are the admirals, vice-admirals, and rear-admirals. The flag-officers in our pay, are the admiral, vice-admiral, and rear-admiral, of the white, red, and blue. See Admiral.

Flag ship, a ship commanded by a general or flag-officer, who has a right to carry a flag, in contradistinction to the secondary vessels under the command thereof.

Flagellantes, *whippers*, in church-history, certain enthusiasts in the thirteenth century, who maintained, that there was no remission of sins without flagellation, or whipping. Accordingly, they walked in procession, preceded by priests carrying the cross, and publicly lashed themselves, till the blood dropped from their naked backs.

Flageolet, a little flute, used chiefly by shepherds, and country-people. It is made of box, or other hard wood, and sometimes of ivory, and has six holes besides that at the bottom, the mouth-piece, and that behind the neck. See the article Flute.

Flail, an instrument for thrashing corn. A flail consists of the following parts: 1. the hand-staff, or piece held in the thresher's hand; 2. the swiple, or that part which strikes out the corn; 3. the caplins, or strong double leathers, made fast to the tops of the hand-staff and swiple; 4. the middle band, being the leather thong, or fish-skin, that ties the caplins together.

Flambeau, a kind of large taper, made of hempen

wicks, by pouring melted wax on their top, and letting it run down to the bottom. This done, they lay them to dry; after which, they roll them on a table, and join four of them together by means of a red-hot iron; and then pour on more wax, till the flambeau is brought to the size required, Flambeaus are of different lengths, and made either of white or yellow wax.

Flame. Simple ignition never exceeds in intensity of light the body by the contact of which it is produced: but flame consists of volatile inflammable matter, in the act of combustion, and combination, with the oxygen of the atmosphere. Many metallic substances are volatilized by heat, and burn with a flame, by contact of the air in this pure state. Sulphur in the act of inflammation is volatilized, and in that state it unites with the oxygen of the air, and forms Sulphuric acid, which see.

Flamen, in Roman antiquity, the name of an order of priests, instituted by Romulus or Numa; authors not being agreed on this head.

Flanel, or Flannel, a loose sort of woollen stuff, not crossed, and wove on a loom with two treddles, like baize.

Flats, in music, a kind of additional notes, which, together with sharps, serve to remedy the defects of musical instruments, wherein temperament is required.

Flax, See *Linum*.

Flea, *pulex*, in zoölogy, a genus of insects without wings, of a roundish, compressed figure: the legs are three pair, and formed for leaping: the eyes are two, and simple; the mouth is bent down-

ward; the colour is a deep purple, approaching to black. The flea is an insect which infests birds, as well as quadrupeds, and lays eggs, called nits: these produce a kind of nympha, or white worms; which after some time are transformed, in the manner of caterpillars, into perfect fleas.

Fleece, *Order of the golden*, an order of knighthood instituted by Philip II. duke of Burgundy. These knights at first were twenty-four, besides the duke himself, who reserved the nomination of six more: but Charles V. increased them to fifty. He gave the guardianship of this order to his son, Philip, king of Spain, since which the Spanish monarchs are chiefs of the order. The knights had three different mantles ordained them at the grand solemnity, the collar and fleece.

Fleecy *Hosiery*, a useful kind of manufacture in which fine fleeces of wool are interwoven into a cotton piece of the common stocking texture. Any thing manufactured in this way, has, on one side, the appearance of common hosiery, and on the other that of raw wool.

Fleet, commonly implies a company of ships of war, belonging to any prince or state: but sometimes it denotes any number of trading ships, employed in a particular branch of commerce. In sailing, a fleet of men of war usually divide into three squadrons; the admiral's, the vice admiral's, and the rear admiral's squadron, all which being distinguished by their flags and pendants, are to put themselves, and, as near as may be, to keep themselves, in their customary places, viz. The admiral, with his squadron, to sail in the van, that so he may lead the way to all the rest in the day time, by the

sight of his flag in the main-top mast head; and in the night-time, by his lights or lanterns. The vice-admiral and his squadron, are to sail in the centre or middle of the fleet; the rear-admiral and the ships of his squadron, to bring up the rear. Sometimes, other divisions are made, and those composed of the lighter ships, and the best sailors, are placed as wings to the van, centre, and rear.

Merchant-fleets generally take their denomination from the place they are bound to, as the "Turkey-fleet," "East India-fleet." These, in times of peace, go in fleets for their mutual aid and assistance: in time of war, besides this security, they likewise procure convoys of men of war, either to escort them to the places whither they are bound, or only a part of the way, to a certain place or latitude.

FLEET-DITCH, a small stream, which, rising in the adjacent country, passing through Clerkenwell, and running under a market to which it gives name, empties itself into the Thames, on the right of Blackfriars-bridge, in London. The name "fleet" is not commonly accounted for; but it appears to originate in the flowing of the tide of the Thames into its mouth, a circumstance more particularly observable near that river, where alone the stream is so called. *Fleta*, from the Saxon *fleot*, signifies, in barbarous Latin, a place where the tide comes up.

FLEET-*prison*, a gaol to which persons are committed by the courts of chancery and common-pleas; or in which they are confined for debt. It has its name from a small stream, called Fleet-ditch, close to which it stands.

Flesh, the muscular part of an animal body, in which the blood-vessels are so small as to retain only blood enough to give them a red colour.

Flint, in natural history, a semi-pellucid stone, composed of crystal debased with earth, of one uniform substance, and free from veins; but of different degrees of colour, according to the quantity of earth it contains, and naturally surrounded with a whitish crust. Flint is a stone of an extremely fine, compact, and firm texture, and very various, both in size and figure. It is of all the degrees of grey, from nearly quite black, to almost quite white. It breaks with a fine, even glossy surface; and is moderately transparent, very hard, and capable of a fine polish. It readily strikes fire with steel, makes not the least effervescence with aquafortis, and burns to whiteness. Its uses in glass making are well known.

It is not uncommon to find on the shores fine, pellucid, flinty bodies, streaked or veined with white, black, brown, &c. These are the agates of Britain, answering in every particular, but fineness, to the gem.

The manner of preparing flints, for the nicer operations in the glass-trade, is this: after they are freed from the white crusts with which they are commonly surrounded, they are calcined in a strong fire, and then powdered in an iron mortar, the powder being sifted through a very fine sieve; on this powder some weak aquafortis is poured, to dissolve any particles of iron it may have imbibed from the mortar; then, after standing some time, it is washed with hot-water, and dried for use.

Float-*boards*, those boards fixed to water-wheels

of under shot mills, serving to receive the impulse of the stream, by which the wheel is carried round. See Mill.

Flood, among seamen, is when the tide begins to come up, or the water begins to rise, then they call it young flood; after which it is a quarter flood, half flood, and high flood.

Flota, a name which the Spaniards give particularly to the ships that are annually sent from Cadiz to the port of Vera Cruz, to fetch thence the merchandizes gathered in Mexico for Spain. This fleet consists of the captains, admiral, and patach or pinnace, which goes on the king's account, and about sixteen ships, from four hundred to a thousand tons, belonging to particular persons. They set out from Cadiz about the month of August, and make it about eighteen or twenty months before they return.

Flotilla, a name given to a number of ships which get before the rest in their return, and give information of the departure and cargo of the flota and galleons. See the preceding article.

Flour, the meal of corn, finely ground and sifted. The grain itself is not only subject to be eaten by insects in that state, but when ground into flour it gives birth to another race of destroyers, who increase so fast, that it is not long before they wholly destroy the substance. The finest flour is most liable to breed these, especially when stale. Flour, when carefully analyzed, is found to consist (1) of fæcula, which is insoluble in cold water: (2) of gluten: (3) of a saccharine matter, susceptible of spirituous fermentation.

Flower, in Botany, that beautiful vegetable pro-

duction which surrounds, nourishes, and fertilizes the seed or fruit in its earliest state.

Flowers, in chemistry, a term formerly applied to a variety of substances procured by sublimation, and were in the form of slightly colouring powder: hence, in all old books, we find mention made of the flowers of antimony, arsenic, zinc, and bismuth, which are the sublimed oxides of these metals, either pure, or combined with a small quantity of sulphur: we have also still in use, though not generally, the terms flowers of sulphur, benzoin, &c.

Fluates, in chemistry, salts of which the Fluoric acid (which see) is the chief ingredient. Fluor spar, denominated fluate of lime, which is found in great plenty in many countries, and is very abundant in Derbyshire, where it obtains the name of Derbyshire spar, is the most important among the fluates. The chief properties of these salts are, 1. When sulphuric acid is poured upon them, they emit acrid vapours of fluoric acid, which corrode glass. 2. When heated, several of them phosphoresce. 3. They are not decomposed by heat, nor altered by combustibles. 4. They combine with silica by means of heat.

Fluid, in physiology, an appellation given to all bodies whose particles easily yield to the least partial pressure, or force impressed.

The nature of a fluid, as distinguished from that of a solid, or hard body, consists in this, that its particles are so loosely connected together, that they readily move out of their places, when pressed with the least force one way more than another; whence philosophers have concluded, that these particles are exceedingly minute, smooth, and round,

it being otherwise impossible they should move with such freedom upon the least inequality of pressure.

Those particles, considered separately, are endowed with all the common properties of matter, and are subject to the same laws of motion and gravitation with larger bodies. To inquire, therefore, into the nature of fluids, is to consider what appearances a collection of very small round bodies, subject to these laws, will exhibit under different circumstances.

Fluids, *motion of*. The motion of fluids, viz. their descent or rise below or above the common surface or level of the source or fountain, is caused either, 1. By the natural gravity or pressure of the fluid contained in the reservoir, or fountain; or, 2. By the pressure or weight of the air on the surface of the fluid in the reservoir, when it is at the same time either taken off or diminished on some part in aqueducts, or pipes of conduit. 3. By the spring or elastic power of compressed or condensed air, as in the common water engine. 4. By the force of pistons, as in all kinds of forcing pumps, &c. 5. By the power of attraction, as in the case of tides, &c.

Fluor spar, the native fluate of lime, from whence is obtained

Fluoric *acid*: the most remarkable property of this acid, is the facility with which it corrodes glass and all siliceous bodies, especially when hot, and the ease with which it holds silica in solution, even when in a state of gas. Hence this acid has been applied to etching on glass vessels.

Flute, an instrument of music, the simplest of

all those of the wind kind. It is played on by blowing it with the mouth, and the tones or notes are changed by stopping and opening the holes disposed for that purpose along its side. The antient fistulæ, or flutes, were made of reeds, afterwards of wood, and lastly of metal: but how they were blown, whether as our flutes, or as hautboys, does not appear.

It is plain some had holes, which, at first, were but few, but afterwards increased to a great number, and some had none; some had single pipes, and some a combination of many, particularly Pan's syringa, which consisted of seven reeds joined together sidewise.

Flute, *German*, an instrument entirely different from the comman-flute. It is not, like that, put into the mouth to be played, but the end is stopped, with a tampion, or plug; and the lower lip is applied to a hole about two inches and a half, or three inches, distant from the end. This instrument is usually about a foot and a half long; rather bigger at the upper end than the lower; and perforated with holes, besides that for the mouth, the lowest of which is stopped and opened by the little finger pressing on a brass, or sometimes a silver key, like those in hautboys, bassoons, &c. Its sound is exceedingly sweet and agreeable; and serves as a treble in a concert.

Flutes or *flutings*, in architecture, perpendicular channels, or cavities, cut along the shaft of a column, or pilaster. They are chiefly effected in the Ionic order, where they had their first rise; though, indeed, they are used all in the richer orders, as the Corinthian and Composite; but seldom in the Doric,

and scarcely ever in the Tuscan. Each column has twenty-four flutes, and each flute is hollowed in exactly a quadrant of a circle: but the Doric has but twenty. Between the flutes are little spaces that separate them, which Vitruvius calls *stria*, and we *lists*: though, in the Doric, the flutes are frequently made to join to one another, without any intermediate space at all; the list being sharpened off to a thin edge, which forms a part of each flute.

Flux, a general term, in chemistry, to denote any substance or mixture added to assist in the fusion of minerals. The fluxes made use of in experiments consist usually of alkalies, which render earthy mixtures fusible, by converting them into glass; or by converting glass itself into powder. See Glass.

Fluxions, a method of calculation invented by sir Isaac Newton. In this branch of mathematics, magnitudes of every kind are supposed to be generated by motion. This science is employed in the investigation of curves, in finding the contents of solids, and computing their surfaces; in finding the centres of gravities and oscillation of different bodies; the attractions of bodies under different forms; the direction of wind which has the greatest effect on an engine; and in the solution of many other interesting and important problems.

Flyers, in architecture, such stairs as go straight, and do not wind round; nor have the steps made tapering, but the fore and back part of each stair, and the ends, respectively parallel to one another; so that if one flight do not carry you to your intended height, there is a broad half space, whence

you begin to fly again, with steps every where of the same length and breadth, as before.

Flying, the progressive motion of a bird, or other winged animal, in the liquid air. The parts of birds chiefly concerned in flying are the wings, by which they are sustained or wafted along. The tail, Willoughby, Ray, and many others, imagine to be principally employed in steering and turning the body in the air, as a rudder: but Borelli has put it beyond all doubt, that this is its least use, and that it is to assist the bird in its ascent and descent in the air; and to obviate the vacillations of the body and wings: for the turning to this or that side is performed by the wings, and inclinations of the body, and but very little by the help of the tail. The flying of a bird, in effect, is quite a different thing from the rowing of a vessel. Birds do not vibrate their wings towards the tail, as oars are struck towards the stern, but waft them downwards: nor does the tail of the bird cut the air at right angles, as the rudder does the water; but is disposed horizontally, and preserves the same situation what way soever the bird turns.

In a word, as a vessel is turned about on its centre of gravity to the right, by a brisk application of the oars to the left, so a bird in beating the air with its right wing alone, towards the tail, will turn its fore part to the left. Thus pigeons, changing their course to the left, would labour with their right wing, keeping the other almost at rest. Birds of a long neck alter their course by the inclinations of their head and neck, which altering the course of gravity, the bird will proceed in a new direction.

"The manner of Flying" is this: the bird first bends his legs, and springs with a violent leap from the ground; then opens and expands the joints of his wings, so as to make a right line perpendicular to the sides of his body: thus the wings, with all the feathers therein, constitute one continued lamina. Being now raised a little above the horizon, and vibrating the wings with great force and velocity perpendicularly against the subject air, that fluid resists those successions, both from its natural inactivity and elasticity, by means of which the whole body of the bird is protruded. The resistance the air makes to the withdrawing of the wings, and consequently the progress of the bird, will be so much the greater, as the waft or stroke of the fan of the wing is longer: but as the force of the wing is continually diminished by this resistance, when the two forces come to be in equilibrio, the bird will remain suspended in the same place; for the bird only ascends so long as the arch of air the wing describes, makes a resistance equal to the excess of the specific gravity of the bird above the air. If the air, therefore, be so rare as to give way with the same velocity as it is struck withal, there will be no resistance, and consequently the bird can never mount. Birds never fly upwards in a perpendicular line, but always in a parabola. In a direct ascent, the natural and artificial tendency would oppose and destroy each other, so that the progress would be very slow. In a direct descent they would aid one another, so that the fall would be too precipitate.

Flying, *Artificial*, that attempted by men, by the assistance of mechanics. The art of flying has

been attempted by several persons in all ages. The Leucadians, out of superstition, are reported to have had a custom of precipitating a man from a high cliff into the sea, first fixing feathers, variously expanded, round his body, in order to break his fall. Friar Bacon, who lived nearly five hundred years ago, not only affirms the art of flying possible, but assures us, that he himself knew how to make an engine wherein a man sitting might be able to convey himself through the air, like a bird; and farther adds, that there was then one who had tried it with success: but this method, which consisted of a couple of large, thin, hollow copper globes, exhausted of the air, and sustaining a person who sat thereon, Dr. Hook shows to be impracticable. The philosophers of Charles the Second's reign, were much busied about this art. The famous bishop Wilkins was so confident of success in it, that he says, he does not question but, in future ages, it will be as usual to hear a man call for his wings, when he is going a journey, as it is now to call for his boots.

FLYING-*army*, a small body under a lieutenant or major-general, sent to harrass the country, intercept convoys, prevent the enemy's incursions, cover its own garrisons, and keep the enemy in continual alarm.

FLYING-*fish*, a name given by English writers to several species of fish, which, by means of their long fins, have a method of keeping themselves out of the water a long time.

FOCUS, in geometry and conic sections, a point where the rays reflected from all parts of a curve concur and meet.

Fog, a meteor consisting of gross vapours, floating near the surface of the earth.

Foil, among jewellers, a thin leaf of metal placed under a precious stone, in order to make it look transparent, and give it an agreeable different colour, either deep or pale: thus, if you want a stone to be of a pale colour, put a foil of that colour under it; or if you would have it deep, lay a dark one under it. These foils are made either of copper, gold, or gold and silver together: the copper foils are commonly known by the name of Nuremberg or German foils.

Foliating *of looking-glasses*, the spreading the plates over, after they are polished, with quicksilver, &c. in order to reflect the image. It is performed thus: a thin blotting paper is spread on the table, and sprinkled with fine chalk; and then a fine lamina or leaf of tin, called foil, is laid over the paper; upon this mercury is poured, which is to be distributed equally over the leaf with a hare's foot, or cotton: over this is laid a clean paper, and over that the glass-plate, which is pressed down with the right-hand, and the paper drawn gently out with the left: this being done, the plate is covered with a thicker paper, and laden with a greater weight, that the superfluous mercury may be driven out, and the tin adhere more closely to the glass. When it is dried, the weight is removed, and the looking-glass is complete.

Folkmote, was the common council of all the inhabitants of a city or town, or borough: or according to Spelman the folkmote was a sort of annual parliament or convention of the bishops, thanes, aldermen, and freemen on every May-day.

Fomentation, in medicine, the bathing any part of the body with a convenient liquor; which is usually a decoction of herbs, water, wine, or milk; and the applying of bags stuffed with herbs and other ingredients, which is commonly called dry fomentation.

Font, among ecclesiastical writers, a large bason, in which water is kept for the baptizing of infants, or other persons. It is so called, probably, because baptism was usually performed among the primitive Christians at springs or fountains. In process of time the font came to be used, being placed at the lower end of the church, to intimate, perhaps, that baptism is the rite of admission into the Christian Church. By the canons of the Church of England, every church is to have a font made of stone; because, according to Durandus, the water which typified baptism in the wilderness flowed from a rock; or, rather, because Christ is in Scripture called the corner-stone, and the rock.

Font, or Fount, in printing, see *Fount*.

Food, in its largest sense, direct and metaphorical, whatever is taken for nourishment; in reference to the animal economy, whatever solid or liquid aliment is received into the stomach; and, in a more confined sense, solid aliment only.

Fool, according to Mr. Locke, is a person who makes false conclusions from right principles; whereas a madman, on the contrary, draws right conclusions from wrong principles.

Foot, a part of the body of most animals whereon they stand. Animals are distinguished, with respect to the number of their feet, into *bipeds*, two-footed; such are men and birds; *quadrupeds*,

four-footed; such are most land-animals: and *multipedes*, or many-footed, as insects. The reptile-kind, as serpents, have no feet; the crab-kind of fish have ten feet; but most other fishes have no feet at all: the spider, mite, and polypus have eight; flies, and grass-hoppers, have six feet. Animals destined to swim, and water-fowl, have their toes webbed together, as the goose and duck, &c. The fore-feet of the mole, rabbit, &c. are formed for digging and scratching up the earth, in order to make way for their head.

Foot, in the Latin and Greek poetry, a metre or measure, composed of a certain number of long and short syllables. These feet are commonly reckoned twenty-eight in number, of which some are simple, as consisting of two or three syllables, and are therefore called disyllabic or trisyllabic feet; others are compound, consisting of four syllables, and are therefore called tetrasyllabic feet.

Foot is also a long measure, or measure of length, consisting of 12 inches.

Geometricians divide the foot into 10 digits, and the digit into 10 lines.

Foot square, is the same measure, both in breadth and length, containing 144 square or superficial inches.

Foot, cubic or solid, is the same measure in all the three dimensions, length, breadth, and depth or thickness, containing 1728 cubic inches.

Forage, in the military art. denotes hay, oats, barley, wheat, grass, clover, &c. brought into the camp by the troopers, for the sustenance of their horses. Dry forage is the hay, oats, &c. delivered out of the magazines, to an army in garrison, or

when they take the field, before the green forage is sufficiently grown up to supply the troops. It is the business of the quarter-master-general to appoint the method of forage, and post proper guards for the security of the foragers.

Force, in mechanics, denotes the cause of the change in the state of a body, when being at rest it begins to move.

Fore-castle of a ship, that part where the foremast stands. It is divided from the rest by a bulkhead.

Foremast of a ship, a large round piece of timber, placed in her fore-part, or fore-castle, and carrying the foresail and fore top-sail yards. Its length is usually 8-9ths of the main-mast; and the fore-top gallant-mast is half the length of the fore-top-mast. See Mast.

Foremast-men are those on board a ship that take in the top-sails, sling the yards, furl the sails, bowse, trice, and take their turn at the helm.

Forest, in law, is defined to be a certain territory of woody grounds, and fruitful pastures, privileged for wild beasts and fowls of forest, chase, and warren, to rest and abide under the protection of the king, for his princely delight, bounded with unremoveable marks, and meres, either known by matter of record or prescription; replenished with wild beasts of venery, or chace, with great coverts of vert for the said beasts; and for preservation and continuance whereof, with the vert and venison, there are certain particular laws, privileges, and officers.

Forests, in England, are of so great antiquity, that, excepting the New-forest in Hampshire,

erected by William the Conqueror, and Hampton-court, erected by Henry VIII. it is said, that there is no record or history which makes any certain mention of their erection, though they are mentioned by several writers, and in divers of our laws and statutes.

There are sixty-nine forests in England, thirteen chaces, and eight hundred parks. The four principal forests are New-forest, Sherwood-forest, Dean-forest, and Windsor forest.

A forest, strictly taken, cannot be in the hands of any but the king, for no other person but the king has power to grant a commission to be justice in eyre of the forest; yet, if he grants a forest to a subject, and that on request made in the chancery, that subject and his heirs shall have justices of the forest, in which case the subject has a forest in law.

Forest towns, in geography, certain towns of Swabia, in Germany, lying along the Rhine, and the confines of Switzerland, and subject to the house of Austria. Their names are Rhinefield, Seckingen, Lauffenburg, and Waldshut.

Fore-staff, or cross-staff, an instrument used at sea for taking the altitude of the sun, moon, or stars. It is called fore-staff, because the observer, in using it, turns his face towards the object; whereas, in using Davis's quadrant, the back of the observer is towards the object; and hence its denomination of back-staff.

Forestalling, in law, buying or bargaining for any corn, cattle, victuals, or merchandize, in the way as they come to fairs or markets to be sold, be-

fore they get thither, with an intent to sell the same again at a higher price.

Forester, a sworn officer of the forest, appointed by the king's letters-patent, to walk the forest at all hours, to watch over the vert and venison; also to make attachments and true presentments of all trespasses committed within the forest.

Forfeiture, properly signifies the effect of transgressing some penal law, and extends to lands or goods. Forfeiture differs from confiscation, in that the former is more general, while confiscation is particularly applied to such things as become forfeited to the king's exchequer; and goods confiscated, are said to be such as nobody claims.

Forficula, the earwig, a genus of insects of the order coleoptera, containing eighteen species, of which the forficula auricularia is very common in wet ground, ripe fruit, and old wood; and has been occasionally found to creep into the ears of such as sleep in the open air; when it is easily destroyed by dropping into the ear either a little oil or spirits, or both. The eggs are white and oval, and large for the size of the insect; they are found deposited in damp situations, and generally under stones. The parent is more provident of the young larvæ than insects generally are, brooding over them for several hours in the day, after the manner of birds.

Forge, properly signifies a little furnace, wherein smiths and other artificers of iron or steel, &c. heat their metals red-hot, in order to soften and render them more malleable and manageable on the anvil.

Forge is also used for a large furnace, wherein

iron-ore, taken out of the mine, is melted down; or it is more properly applied to another kind of furnace, wherein the iron-ore, melted down and separated in a former furnace, and then cast into sows and pigs, is heated and fused over again, and beaten afterwards with large hammers, and thus rendered more soft, pure, ductile, and fit for use. Of these there are two kinds: the first is called the finery, where the pigs are worked into gross iron, and prepared for the second, which is called the chafery, where it is farther wrought into bars fit for use.

Forgery, an offence which, at common law, is punishable with fine, imprisonment, and pillory, and by statute, in the generality of cases, with death. A forgery, to be capital, consists in affixing the name of an individual, in a manner purporting to be his hand-writing, to a paper, the contents of which tend to the injury of his estate.

Forging, in smithery, the beating or hammering iron on the anvil, after having first made it red-hot in the forge, in order to extend it into various forms, and fashion it into works. There are two ways of forging and hammering iron; one is by the force of the hand, in which there are usually several persons employed, one of them turning the iron and hammering likewise, and the rest only hammering. The other way is by force of a water-mill, which raises and works several huge hammers beyond the force of man; under the strokes whereof the workmen present large lumps or pieces of iron, which are sustained at one end by the anvils, and at the other by iron-chains fastened to the ceiling of the forge.

This last way of forging is only used in the

largest works, as anchors for ships, which usually weigh several thousand pounds. For the lighter works, a single man serves to hold heat, and turn with one hand, while he hammers with the other.

Every purpose the work is designed for, requires its proper heat; for if it be too cold, it will not feel the weight of the hammer, as the smiths call it, when it will not batter under the hammer; and if it be too hot, it will red-sear, that is, break, or crack, under the hammer.

The several degrees of heats the smiths give their irons are, first, a blood-red heat; secondly, a white flame-heat; and, thirdly, a sparkling or welding-heat.

Forlorn-hope, in the military art, signifies men detached from several regiments, or otherwise appointed, to make the first attack in the day of battle; or, at a siege, to storm the counterscarpe, or mount the breach. They are so called from the great danger to which they are unavoidably exposed; but the word is old, and begins to be obsolete.

Form, *Printer's* an assemblage of letters, words, and lines, ranged in order, and so disposed into pages by the compositor; from which, by means of ink and a press, the printed sheets are drawn. Every form is inclosed in an iron chase, wherein it is firmly locked by a number of pieces of wood, some long and narrow, and others of the form of wedges. There are two forms required for every sheet, one for each side; and each form consists of more or fewer pages, according to the size of the book.

Formic *acid*, in chemistry, the acid of ants,

which is extracted from them either by distillation or expression with water; in the living insect it reddens blue flowers, goes off in the form of a vapour, smelling like musk, and destroys animals. Under this gaseous form it is capable of serving economical purposes like vinegar; is decomposed by a great heat, takes oxygen from oxygenated muriatic acid; and forms salts with alkalies and earths, which are chrystallizable and not deliquescent.

Formica, the ant, a genus of insects of the order hymenoptera: females and neuters are armed with a concealed sting; males and females with wings; neuters wingless. This is a gregarious and proverbially industrious family, consisting like bees of males, females, and a third kind, which are yet called neuters. These last are the well known little insects who construct the nest, or ant hills, who labour with such unremitting assiduity for the support of themselves and the idle males and females, and who guard with such ferocity the larvæ, or what are commonly called ants eggs. They wander about all day in search of food or materials for the nest, and assist each other in bringing home what is too cumbersome for such as have attempted it. They every day bring out of their nest and expose to the warmth of the sun the newly hatched larvæ and feed them till they are able to provide for themselves. In the evening they consume together whatever has been collected during the day, and do not as is commonly supposed lay up store for the winter, but probably against that season become torpid and die.

Fort, in the military art, a small fortified place,

environed on all sides with a moat, rampart, and parapet. Its use is to secure some high ground, or the passage of a river, to make good an advantageous post, to defend the lines and quarters of a siege, &c. Forts are made of different figures and extents, according as the ground requires. Some are fortified with bastions, others with demi-bastions. Some again are in form of a square, others of a pentagon. A fort differs from a citadel, as this last is built to command some town.

Fortification, the art of fortifying a town, or other place; or of putting it in such a posture of defence, that every one of its parts defends, and is defended, by some other parts, by means of ramparts, parapets, moats, and other bulwarks; to the end, that a small number of men within may be able to defend themselves for a considerable time against the assaults of a numerous army without; so that the enemy, in attacking them, must of necessity suffer great loss.

Fortification is either ancient or modern, regular or irregular. Ancient fortification, at first, consisted of walls or defences made of trunks, and other branches of trees, mixed with earth, to secure them against the attacks of the enemy. This was afterwards altered to stone-walls, on which were raised breast works, behind which they made use of their darts and arrows in security. Modern fortification, is that which is flanked and defended by bastions and out-works, the ramparts of which are so solid, that they cannot be beat down but by the continual fire of several batteries of cannon. Regular fortification is that built in a regular polygon, the sides and angles of which are all equal, being commonly

about a musket-shot from each other. Irregular fortification, on the contrary, is that where the sides and angles are not uniform, equidistant, or equal; which is owing to the irregularity of the ground, valleys, rivers, hills, and the like.

The principal maxims of fortification are these: 1. That every part of the works be seen and defended by other parts, so that the enemy can lodge no where without being exposed to the fire of the place. 2. A fortress should command all places round it; and therefore all the out-works ought to be lower than the body of the place. 3. The works farthest from the centre, ought always to be open to those more near. 4. No line of defence should exceed a point blank musket-shot, which is about an hundred and twenty or an hundred and twenty-five fathoms. 5. The more acute the angle at the centre is, the stronger will be the place. 6. In great places, dry trenches are preferable to those filled with water, because sallies, retreats, and succours are frequently necessary; but, in small fortresses, water-trenches, that cannot be drained, are best, as standing in need of no sallies. Different authors recommend different methods of fortification; but the principal are those of Pagan, Blondel, Vauban, and Scheiter.

Fortitude, a quality of the mind, sometimes but erroneously considered as the same with courage. Courage may be a virtue or a vice: fortitude is always a virtue: we speak of a desperate courage, but never of a desperate fortitude. A mere contempt of danger may be called courage, and this is found in some brutes as well as in the human race. In man it depends partly on habit,

partly on strength of nerves, and partly on want of consideration. But fortitude is the virtue of a rational and considerate mind founded on a sense of honour, and a regard to duty. The motives to fortitude are many and powerful, and this virtue tends much to the happiness of the individual, by giving composure and presence of mind, and keeping the other passions in due subordination.

Forum, in Roman antiquity, a public standing place within the city of Rome, where causes were judicially tried, and orations delivered to the people.

Fossil, in natural history, any thing dug out of the earth, whether that be its natural or its accidental situation; a body of the first kind being called native, and one of the second extraneous.

I. *Native fossils* are substances found either buried in the earth, or lying on its surface, of a plain simple structure and showing no signs of containing vessels, or circulating juices.

II. *Extraneous fossils* are bodies of the vegetable or animal kingdoms, accidentally buried in the earth.

1. Of the vegetable, the principal kinds are trees and herbaceous plants, or the parts of these.

2. Of the animal there are four kinds: 1. seashells; 2. the teeth, or bony palates and bones of fishes; 3. complete fishes; 4. the bones of land animals.

Foundery, or foundry, the art of casting all sorts of metals into different forms. It likewise signifies the work-house, or smelting hut, wherein these operations are performed.

FOUNDERY, *Letter*, or *casting of printing letters.* The first thing requisite is to prepare good steel-punches, on the face of which is drawn the exact shape of the letter with pen and ink, if the letter be large; or with a smooth blunted point of a needle, if small; and then, with proper gravers, the cutter digs deep between the strokes, letting the marks stand on the punch; then files the outside, till it is fit for the matrice. They have a mould by which to justify or regulate the matrices, and which consists of an upper and under part, both which are alike, except the stool and spring behind, and a small roundish wire in the upper part for making the nick in the shank of the letter. These two parts are exactly fitted into each other to slide backward and forward. Then they justify the mould, by casting about twenty samples of letters, which are set in a composing-stick, with the nicks towards the right hand; and comparing these every way with the pattern-letters, set up in the same manner, they find the exact measure of the body to be cast. Next they prepare the matrice, which is of brass or copper, an inch and a half long, and of a proportionable thickness to the size of the letter it is to contain. In this metal is sunk the face of the letter by striking the letter punch the depth of an *n*. After this, the sides and face of the matrice are justified, and cleared, with files, of all bunchings that have been made by sinking the punch. Then it is brought to the furnace, which is built upright of brick with square sides, and a stone at top, in which is a hole for the pan to stand in. They have several of these furnaces. The metal of which types are formed is lead, with a

mixture of the regulus of antimony, or such other substance as the letter founder approves. These being duly mixed and melted in a large cauldron of cast-iron, by continued stirring with an iron ladle, the workmen proceed to draw the metal off into small troughs of cast-iron, which are ranged to the number of fourscore on a level platform faced with stone. In the course of a day, fifteen hundred-weight of metal can be prepared in this manner.

The founder must now be provided with a ladle differing from other iron ladles only in its size, which is adapted to that of the letter he is to cast. Before he begins this operation, he must kindle the fire in his furnace to melt the metal in the pan. If it be a small bodied letter, or a thin letter with great bodies, that he intends to cast, his metal must be very hot, and sometimes red hot, to make the letter come. Then taking a ladle that will hold as much as will make the letter and break, he lays it at the hole, where the flame bursts out, to heat; then he ties a thin leather cut with its narrow end against the face, to the leather groove of the matrice, by whipping a brown thread twice about the leather groove, and fastening the thread with a knot. Then he puts both pieces of the mould together, and the matrice into the matrice-cheek; and places the foot of the matrice on the stool of the mould, and the broad end of the leather on the wood of the upper haft of the mould, but not tight up, lest it hinder the foot of the matrice from sinking close down upon the stool, in a train of work. Afterward, laying a little rosin on the upper part of the mould, and having his casting-ladle hot, he,

with the bolling side, melts the rosin and presses the broad end of the leather hard down on the wood, and so fastens it thereto. In the act of casting, placing the under half of the mould in his left hand with the hook or jag forward, he holds the ends of its wood between the lower part of the ball of his thumb and his three hinder fingers; then, he lays the upper half of the mould upon the under half; and, at the same time, the foot of the matrice places itself upon the stool, and clasping his left hand thumb strongly over the upper half, he nimbly catches hold of the bow, or spring, with his right hand fingers at the top of it, and his thumb under it, and places the point of it against the middle of the notch in the reverse side of the matrice, pressing it forward as well toward the mould as downward, by the shoulder of the notch, close upon the stool, while at the same time, with his hinder fingers, he draws the under half of the mould toward the ball of his thumb, and thrusts with the ball of his thumb, the upper part towards his fingers, that both the registers of the mould may press against both sides of the matrice, and his thumb and fingers press both sides of the mould close together. Then he takes the handle of his ladle in his right hand, and with the ball of it gives two or three strokes outwards upon the surface of the melted metal, to clear it of the scum; then he takes up the ladle full, and having the mould in the left-hand, turns his left side a little from the furnace, and brings the jet of his ladle to the mouth of the mould; and turns the upper part of his right hand towards him, to pour the metal into it, while at the same instant, he puts the mould

in his left hand forwards, to receive the metal with a strong shake, not only into the bodies of the mould, but, while the metal is yet hot, into the very face of the matrice, to receive its perfect form there as well as in the shank. Then he takes the upper half of the mould off, by placing his right thumb on the end of the wood next his left thumb and his two middle fingers at the other end of the wood: he tosses the letter, break and all, upon a sheet of waste paper, laid on a bench, a little beyond his left hand; and then is ready to cast another letter, as before, and likewise the whole number in that matrice.

Then, boys, commonly employed for this purpose, separate the breaks from the shanks, and rub them on a stone, and afterwards a man cuts them all of an even height, which finishes the fount for the use of the printer. A workman will ordinarily cast 3000 of these letters in a day. The perfection of letters thus cast, consists in their being severally square and straight on every side; all of the same height, and evenly lined, without stooping one way or other; neither too big in the foot, nor the head; well grooved, so as the two extremes of the foot contain half the body of the letter; and well ground, barbed, and scraped, with a sensible notch.

FOUNT or FONT, among printers, a set or quantity of letters, and all the appendages belonging thereto, as numeral characters, quadrates, points, &c. cast by a letter-founder, and sorted.

Founts are large or small, according to the demand of the printer, who orders them by the hundred weight, or by sheets. When a printer orders *a fount of five hundred*, he means that the fount

should weigh 500 *lb.* When he demands a fount of ten sheets, it is understood, that with that fount he shall be able to compose ten sheets, or twenty forms, without being obliged to distribute. The founder takes his measures accordingly; he reckons 120 *lb.* for a sheet, including the quadrates, &c. or 60*lb.* for a form; which is only half a sheet: not that the sheet always weighs 120*lb.* or the form 60*lb.* on the contrary, it varies according to the size of the form; besides, it is always supposed that there are letters left in the cases. As therefore every sheet does not comprehend the same number of letters, nor the same sort of letters, we must observe, that, as in every language some sounds recur more frequently than others, some letters will be in much more use, and oftener repeated than others, and consequently their cells or cases should be better stored than those of the letters which do not recur so frequently: thus, a fount does not contain an equal number of *a* and *b*, or of *b* and *c*, &c. the letter-founders have therefore a list or tariff, or, as the French call it, a *police*, by which they regulate the proportions between the different sorts of characters that compose a fount; and it is evident that this tariff will vary in different languages, but will remain the same for all sorts of characters employed in the same language.

FOUNTAIN, or *artificial fountain*, in hydraulics, called also a *jet d'eau*, is a contrivance by which water is violently thrown upwards. See HYDRAULICS.

FOX, in zoology, an animal of the dog-kind, which much resembles the common dog in form, and is of the size of a spaniel: it is chiefly distin-

guished by its long and straight tail, with the tip white. The fox is a native of most northern countries. That of Siberia is about the size of the common kind; but its head is larger, and its tail not only larger and more bushy, but all of one colour.

Fraction, in arithmetic and algebra, is a part or parts of something considered as an unit or integer.

Fractions are distinguished into vulgar or common, and sexagesimal and decimal. Vulgar fractions consist of two parts or quantities, one written over the other, with a short line between them, as $\frac{2}{5}$ths: this is called two fifths of any unit, as a foot, yard, pound, &c. The 2, or quantity above the line, is called the numerator: the 5, or quantity under the line, is the denominator; If the numerator of a fraction is equal to the denominator, then the fraction is equal to 1. If the numerator is greater than the denominator, then the fraction is greater than unity, and is called an improper fraction: but if the numerator is less than the denominator, then the fraction is proper, and is less than unit, $\frac{3}{3} = 1$. $\frac{2}{5}$ is a proper fraction; $\frac{7}{4}$ is an improper fraction, and is equal $1\frac{3}{4}$ because 7 divided by 4 gives 1 and 3 over.

Fractions are brought to a common denominator by multiplying each numerator by all the denominators except its own, and placing under each numerator the number which arises from multiplying all the denominators together, this is called a common denominator: thus

$$\frac{2}{5} \quad \frac{3}{4} \quad \frac{1}{2} = \frac{16}{40} \quad \frac{30}{40} \quad \frac{20}{40}$$

now these expressions are equal to the former ones, that is $\frac{2}{5} = \frac{16}{40}$, and so of the rest.

To add fractions together, bring them to a common denominator: then add all the numerators to-

gether, and place under their sum the common denominator; in the example above the three fractions added together are $\frac{66}{40} = 1\frac{26}{40}$.

To subtract fractions: bring them to a common denominator, and subtract the less from the greater: thus, as above, to subtract $\frac{1}{2}$ from $\frac{3}{4}$, we have, when brought to a common denominator,

$$\frac{30}{40} - \frac{20}{40} = \frac{10}{40} = \frac{1}{4}$$

Multiplication of fractions is performed by multiplying the numerators together for a new numerator, and the denominators for a new denominator: thus to multiply $\frac{2}{7}$ by $\frac{3}{5}$; we say $\frac{2}{7} \times \frac{3}{5} = \frac{6}{35}$ for the answer.

Fractions are divided by multiplying them crossways, thus to divide $\frac{3}{4}$ by $\frac{5}{8}$: we say,

$$\frac{3}{4} \div \frac{5}{8} = \frac{24}{20} = 1\frac{4}{8}$$

France, a country in Europe, bounded on the North by the English Channel, and the Austrian Netherlands; on the East by Germany, and the Alps which separate it from Switzerland, Savoy, and Piedmont; on the South by the Mediterranean Sea and Spain, from which kingdom it seems naturally divided by the Pyrenees; and the West by the Atlantic. The kingly government of France continued from Clovis, in 486, to the death of Louis XVI. in 1793. It was then declared a republic, and with the fall of monarchy all titles of nobility were abolished, and the religion of the kingdom completely changed. The ancient division into provinces was also changed into that of departments, which were at first 83 in number, but by the addition of conquered countries, the number is now nearly 120. In the year 1804 Bonaparté was made emperor of France, and since that period he has

restored titles of dignity and honour with which to reward his generals and great men; he has subjugated the greater part of the Continent, and placed his brothers and relatives upon thrones which the career of his success had rendered vacant.

Franchise, in a general sense, privilege or exemption from ordinary jurisdiction; as that for a corporation to hold pleas among themselves to a given amount.

Franciscans, Friars-minor, or Grey-friars, religious of the order of St. Francis, by whom they were founded in the year 1209. See Friar.

The rule of the Franciscans, as established by St. Francis himself, is briefly this: they are to live in common, in celibacy, and to pay obedience to the Pope and their superiors. Before they can be admitted into the order, they are obliged to sell all they have, and give it to the poor; they are to perform a year's noviciate, and when admitted never to quit the order upon any account. They are to fast from the feast of All-saints to the Nativity. The Franciscans had sixty-three monasteries in England, one of which was in the parish of St. Nicholas in London.

Franks, an appellation given by the Turks, and other nations of Asia, to all the people of the western parts of Europe, to which they give the name of Frankistan.

Fraxinus, the *ash*, in botany, a genus of trees, belonging to the polygamia dicœcia class: the fruit is single, of a compressed lanceolate figure, and is what we commonly call the ash-key, several clusters of which are affixed to the same common pedicle. The wood of this tree is in great use among

several artificers, as wheel-wrights, cart-wrights, carpenters, and turners, for making ploughs, harrows, axle-trees, oars, and various other articles. It is said to be as lasting for building as oak, and often preferred before it: though the timber of the trunk greatly excels that of a bough. Some ash is also so curiously veined, that the cabinet-makers equal it to ebony, and call it green-ebony; so that the woodmen, who light upon such trees, may have for it what they will.

FREE, or IMPERIAL CITIES, in Germany, are those not subject to any particular prince, but governed, like republics, by their own magistrates; as Hamburg, Bremen, Lubec, and Ratisbon formerly were.

FREEHOLD, signifies lands or tenements which a person holds in fee-simple, fee-tail, or for term of life. Freehold is distinguished into freehold in deed, and freehold in law; the first of which signifies the real possession of lands, &c. in fee, or for life; the other is the right that a person has to such lands or tenements before his entry. Freehold is also extended to such offices as a man holds in fee, or during life.

FREE-STONE, a whitish stone dug up in many parts of England, that works like alabaster, but is more hard and durable. It is a kind of the grit-stone, but finer sanded, and a smoother stone, and is called free, from its being of such a constitution as to cut freely in any direction: such is the Portland-stone, and the free-stone of Kent.

FREEDOM *of a corporation*, the right of enjoying all the privileges and immunities belonging to it. The freedom of cities, and other corporations, is regularly obtained by serving an apprenticeship; but

it is also purchased with money, and sometimes conferred by way of compliment.

Free-thinker, a name usually applied to a *Deist*. Lately a sect of Christians have claimed the title of free-thinking Christians: we suspect they are very weak and shallow thinking Christians.

Freezing, in physics, the same with congelation. When a body passes from a solid to a fluid state, the absorption of heat by that body (the which, as has been said, causes its fluidity), produces a degree of sensible surrounding cold. A very cheap and easy experiment will manifest this fact: take equal parts of salt-petre and sal-ammoniac, finely powdered, and upon three ounces of this mixture pour four ounces of spring water, and it will be found that the sudden dissolution of these salts will render the water so cold as to sink a thermometer plunged in it, thirty-six degrees. As therefore, even in summer, it is easy to procure spring or pump water at the temperature of fifty degrees, the addition of the salts will reduce that temperature to fourteen degrees; which is sufficient to freeze the water of a phial plunged into it, into one complete mass of ice. Another freezing mixture, which is still more powerful, may be made by adding to pounded ice, or to snow, a quantity of common salt. The salt is of a temperature above freezing; but the ice or snow, having a stronger attraction than the salt for the caloric it contains, will absorb the latter: the ice or snow, being thus rendered fluid, will dissolve the salt. From both these effects a great quantity of heat will be absorbed; and consequently the mixture will be much colder than either snow or the salt separately, and

will freeze very powerfully any fluid with which it is brought in contact. See COLD.

FREIGHT, in navigation and commerce, the hire of a ship, or a part thereof, for the conveyance and carriage of goods from one port or place to another; or the sum agreed on between the owner and the merchant, for the hire and use of a vessel.

FRESCO, see PAINTING.

FRET, or FRETTE, in architecture, a kind of knot or ornament, consisting of two lists or small fillets variously interlaced or interwoven, and running at parallel distances equal to their breadth. Every return and intersection of these frets must be at right angles, otherwise they lose all their beauty, and become perfectly gothic. Sometimes the fret consists but of a single fillet, which, if well disposed, may be made to fill its space exceedingly well.

FRIAR, from the French *frere*, a brother, in a general sense, a term common to monks of all orders, founded on this, that there is a kind of fraternity, or brotherhood, between the several religious persons of the same convent or monastery.

Friar, in its more peculiar and proper sense, is restrained to such monks as are priests. "How many modern writers," says Horace Walpole, "confound monks and friars! yet they were almost as different as laymen and priests. Monachism was an old institution for *laymen*. The friars, *freres*, or brothers, were instituted in the thirteenth century, in order, by their preaching, to oppose the Lollards. They united priesthood with monachism; but while the monks were chiefly confined to their respective houses, the friars were wandering about

as preachers and confessors. This gave great offence to the secular clergy, who were thus deprived of profits and inheritances. Hence the satyric and impure figures of friars and nuns in our old churches. Do you remember any example of retaliation? I suppose there were similar libels on the secular clergy in the chapels of friaries now abolished."

Friction, in mechanics, the rubbing of the parts of engines and machines against each other, by which means a great part of the effect is destroyed. The causes of friction are (1) The roughness of the contiguous surfaces: (2) The irregularity of the figure, which arises either from imperfect workmanship, or from the pressure of one body on another: (3) An adhesion, or attraction which is more or less powerful according to the nature of the bodies in question: and 4. The interposition of extraneous bodies, such as moisture, dust, &c. In all machines one fourth or even one third of the power must be considered as lost by friction, that is, if it gain by calculation 450lb. more than about, 300lb. gain, in practice, must not be depended on.

Friday, the sixth day of the week, so called from Frea, or Friga, a goddess worshipped by the Saxons on this day.

Frigate, among seamen, a ship of war, light built, and a good sailer. A frigate has commonly two decks, whence that called a light frigate, is a frigate with only one deck.

Frigatoon, a Venetian vessel, commonly used in the Adriatic sea, with a square stern, and carrying only a main-mast, mizen, and bowsprit.

Fright or terror, a sudden and violent degree of

fear. Sudden fear is frequently productive of very remarkable effects on the human system. In general, the effects of terror are a contraction of the small vessels, and a repulsion of the blood into the large ones, hence proceed general oppression, trembling, and irregularity in the motions of the heart, while the lungs are overcharged with blood.

Fringilla, in ornithology, a comprehensive genus of birds, of the order of the passeres, with the beak of a conic sharp-pointed figure, the two chaps of which mutually receive each other. To this genius belong the gold-finch, the chaff-finch, green-finch, yellow-hammer, canary-bird, linnet, sparrow, &c. The canary-bird was originally brought from the Canary-islands; first known in Europe about the end of the fifteenth century; and not bred in that part of the world till about the middle of the seventeenth. Their naturalization appears to have originated in accident. A vessel which was carrying, among other commodities, a number of these birds to Leghorn, was wrecked on the coast of Italy; and being thus set at liberty, they flew to the nearest land, which was the island of Elba, where they found the climate so favourable that they multiplied, and would probably have become domesticated had they not been caught in snares. It seems that the breed, thus introduced, has long been lost. At Ymst, there is a company which, after the breeding-season is over, send out persons to different parts of Germany and Switzerland to purchase birds from those who breed them, each agent commonly returns with three or four hundred birds, which are afterwards carried for sale not only through every part of Germany,

but also to England, Russia, and even Constantinople. About sixteen hundred are sent yearly to England, where the dealers, notwithstanding the expenses they have incurred, and after having carried them on their backs, perhaps a hundred miles, sell them at a few shillings a-piece.

Frit, in the manufacture of glass, is the principal material in the business. A saline substance drawn from the ashes of the plant kali, or from other plants, mixed with sand or flint, and baked together, makes an opaque substance called frit.

Frize, in commerce, a kind of woollen cloth or stuff, frized or knapped on one side.

Frizing *of cloth*, a term, in the woolen manufactory, applied to the forming of the nap of a cloth, or stuff, into a number of little hard burrs or prominences, covering almost the whole ground thereof.

Frog. See Rana.

Frost, in physics, that state of the natural world in which the atmosphere so absorbs the caloric from bodies on the surface of the globe, as to leave them, more or less, without fluidity or expansion.

It appears that water and other fluids are capable of containing caloric in two very different states. In the one, they seem to imbibe it in such a manner that it eludes all the methods by which it is customary to observe it, either by our sensation of feeling, or by the thermometer; in the other, it manifests itself obviously to the senses, either by the touch, the thermometer, or the emission of light.

In the first of these states, the body is called *cold;* but here we are not to suppose a *total* ab-

sence of heat or caloric: for even those fluids that are coldest contain it in a very considerable proportion. Thus vapour, which is colder to the touch than the water from which it was raised, has in its composition an immense quantity of caloric, even more than sufficient to heat it red hot. The same may be said of common salt, and of snow or ice. If a quantity of each of these substances be separately reduced to the degree of 28 or 30 of Farenheit's thermometer, upon mixing them together, the heat which would have raised the thermometer to that degree, now enters into their substance in such a manner that the mercury falls down to 0. —Here an excessive degree of cold is produced; and yet the substances contain the very same quantity of heat that they did before the mixture; for they absorb it from all bodies around them; and if water in a small vessel be placed in them, they will so draw out its caloric as to reduce it to a mass of ice.

It seems, therefore, that the senses, even when assisted by thermometers, can only judge of the *state* in which the caloric is with relation to surrounding bodies, without regard to its quantity. Thus, if the caloric flows from any part of our bodies into any substance actually in contact with it, the sensation of cold is excited, and we call that substance *cold;* but if it flows from any substance into our bodies, the sensation of heat is excited, and we call that substance *hot;* without regard to the absolute quantity in either case.

Fruit, in general, includes whatever the earth produces for the nourishment and support of man, and other animals; as herbs, grain, hay, and corn.

Fruit also implies an assemblage of seeds in a head, as in a ranunculus; and all kinds of seeds, or grains, whether inclosed in a cover, capsule, or pod; and whether bony, fleshy, skinny, or membranous.

The structure and parts of different fruit differ in some things, but in all the species the essential parts of the fruit appear to be only continuations or expansions of those which are seen in the other parts of the tree; and the same fibres are continued to them from the root. An apple, cut in two transversely, will be found principally composed of four parts: 1. A skin, or rind, which is only a continuation and expansion of the outer bark of the tree. 2. A parenchyma, or pulp, which is an expansion and intumescence of the blea, or inner bark of the tree. 3. The fibres, or ramifications of the woody part of the tree. 4. The core, which is the produce of the pith of the wood, indurated, or strengthened by twigs of the woody fibres intermixed with it. This serves to furnish a proper lodging for the seeds, and filtrates the juices of the parenchyma, or pulp, and conveys them to the seeds.

In plums, cherries, &c. there are four parts, viz. a coat, parenchyma, ramification, and stone. The outer part, or shell of the stone, seems formed of the calculous part of the nutritious juice of the plant; and the inner part, or kernel, of the pith of the tree, derived thither by seminal branches, which penetrate the base of the stone. The acorn consists of a shell, cortex, and medulla: the shell consists of a coat and parenchyma, derived from the bark and wood of the tree. The cortex consists

of an inner and outer part, the first of which is a duplicate of the inner trunk of the shell; the second is a softer substance, derived from the same source as the parenchyma of the shell: but authors are not agreed whether the medulla, or pulp of the kernel, arises from the pith of the tree, or from the cortical part.

Berries, grapes, &c. contain, besides three general parts, viz. coat, parenchyma, and ramification. grains of a stony nature, which are the seeds. Fruits, in the economy of nature, are useful in guarding, preserving, and feeding the inclosed seed.

Frustum, in mathematics, a part of some solid body separated from the rest: the frustum of a cone is the part which remains when the top is cut off by a plane parallel to the base.

Fugue, in music, is when different parts of a musical composition follow each other; each repeating what the first had performed. There are three kinds of fugues; the simple, double and counter.

Fulgora, the lantern fly, is one of the hemiptera order of insects. It is very elegant, as well as a very extraordinary insect. Its length from the tip of the front to that of the tail, is nearly three inches and a half; and from wings end to wings end when expanded, nearly five inches and a half. The head is nearly as long as the whole of the rest of the animal, and is the immediate seat of that light for which this insect is so remarkable. This beautiful insect is a native of Surinam, and other parts of South America, and during the night it diffuses so strong a phosphoric splendour from its head,

that it may be employed for the purpose of a candle or torch. See pl. Nat. Hist. Fig. 20.

Fuller, a workman employed in the woollen manufactories, to mill, or scour cloths, serges, and other stuffs, in order to render them more thick, compact, and durable.

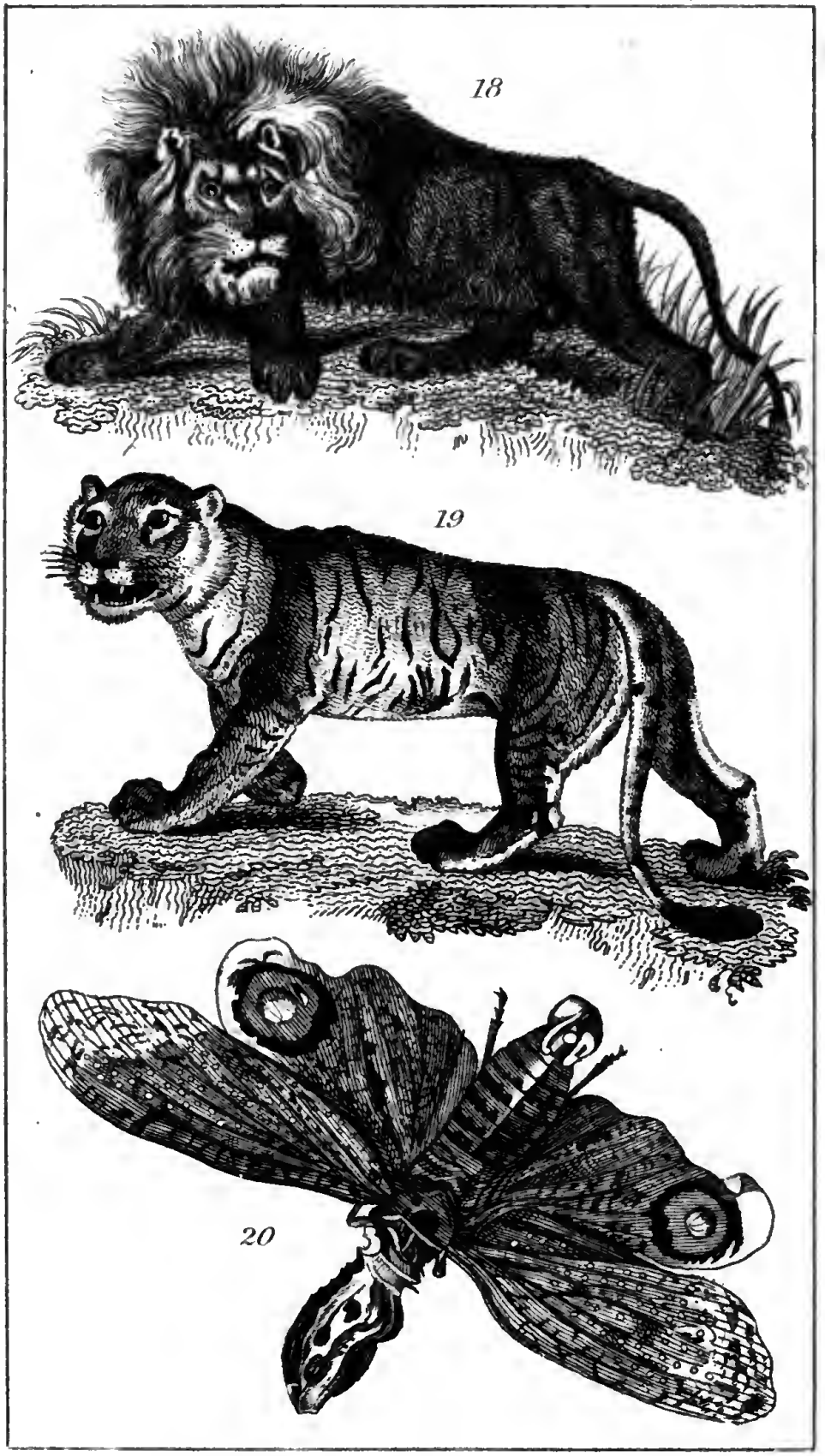
Fuller's-*earth*, in natural history, a soft, greyish, brown, dense, and heavy marle: when dry it is of a greyish, ash-coloured brown, in all degrees from very pale to almost black, and it has generally something of a greenish cast: it is very hard and firm, of a compact texture, of a rough and somewhat dusty surface, that adheres slightly to the tongue: it is very soft to the touch, not staining the hands, nor breaking easily between the fingers.

Fulling, the art or act of scouring and pressing cloths, and other woollen manufactures, to cleanse, thicken, and render them more firm and strong, which is done by means of a water-mill.

Fulmination. In chemistry, explosion or detonation, accompanied with a very considerable degree of sound. All these equally imply rapid decomposition with or without flame, and the intensity of sound alone distinguishes the idea of *fulmination* from those of *detonation* and *explosion*.

Fulminating *Powder*; a powder that explodes upon the application of certain degrees of heat with instantaneous combustion, and prodigious sound. These are sometimes made with metals, and sometimes without.

Funds, a term adopted by those who speak of the public revenue of nations, to signify the several




Cooper sculp.

*Fig. 18.* **Felis** *Leo: Lion.*
*Fig. 19.* **Felis** *Tigris: Tyger.*
*Fig. 20.* **Fulgora** *lanternuria: Lantern fly.*

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taxes that have been laid upon merchandizes either by way of duties of custom, or excise, or in any other manner, to supply the exigencies of the state, and to pay interest for what sums it may have occasion to borrow. Thus it is said, "such a duty, or such a tax, is a good fund to answer such a purpose."

The funds or taxes of the united kingdoms, are either temporary or perpetual: temporary ones, are such as are either imposed for a certain number of years, or annually, as the land and malt-taxes: the perpetual funds, are those on which money has been borrowed for the public service, and which are appropriated for the secure and certain payment of the interest of such money, till the discharge of the principal so borrowed. See STOCKS.

FUNGUS, in botany, an order of vegetables, extremely different from all others, and belonging to the *cryptogamia* class of Linnæus. The fungi have, indeed, so little of the common and general appearance of vegetables, that many have denied them to be such, and contended for their being only excrementous matter, protruded from decaying vegetables of other kind: but, notwithstanding the fungi have neither the colour nor texture of other plants, nor leaves nor flowers like them, yet they must be allowed to belong to the vegetable kingdom, as having absolute and perfect seeds, consisting usually of single antheræ, which produce plants like those from which they are collected.

The fungi are extremely different in figure, and in their manner and place of growth; some growing on the ground, some on living trees, and many

on decayed wood ; and this, horizontally, or erect. Some are of only a few days duration, others remain for years, and some there are which grow under the surface of the earth in no particular direction.

Furbisher, a person who polishes, or cleans arms ; as guns, swords, pistols : an operation which is chiefly performed with emery.

Furlong, a long measure, equal to 1-8th of a mile, or forty poles. It is also used in some law-books, for the eighth part of an acre.

Furlough, in military language, a licence granted by an officer to a soldier, to be absent for some time from his duty.

Furnace, See Laboratory.

Fusion, a chemical process, by which bodies are made to pass from the solid to the fluid state in consequence of the application of heat. The chief objects susceptible of this operation are salts, sulphur and metals. Salts are liable to two kinds of fusion, the one, which is peculiar to saline matters, is owing to water, and is called aqueous fusion ; the other, which arises from the application of fire, is known by the name of igneous fusion.

Fustick, is the wood of the Morus Tinctoria, a tree that grows to a considerable size in the West Indies. It is much used in dyeing yellow, and produces a large quantity of colouring matter.

## G.

G, the seventh letter in the English alphabet, but in the Greek, and all the oriental languages, it occupies the third place. It is a mute, and cannot be sounded without the assistance of a vowel. It has a hard and a soft sound, as in *game*, and *gesture*: as a numeral it formerly stood for 400, and with a dash over it, $\bar{G}$, 400,000. In music it is the character of the treble cleff, and from its being placed at the head, the whole scale took the name Gamut.

Gabres, or *gaurs*, a name given by the Mohammedans to all who do not profess their religion, in the same sense that Christians use the word *infidel*, or *heathen*, and the Jews *gentes*, or *gentiles*. In Persia and in India, the name has a more precise signification, being applied to a religious sect who are said to be the remains of the ancient followers of Zoroaster. They are commonly immersed in the lowest condition of society; and are represented as extremely superstitious, but inoffensive, honest in their dealings, and in every respect rigorous in their morals. They expect a future life and judgment; worship one God; and have even preserved a pure idea of the symbol of fire: for though zealously attached to their religious rites, among which are the sign of adoration to the rising sun, and the custom of performing all their devotions before fire, they declare that they venerate these only as expressive images of the Deity himself.

Gadus, the cod-fish, in natural history. There are 23 species of this genus, the most important is the Gadus morhua, or common cod, which inhabits the northern seas of Europe and America, in innumerable shoals, and constitutes an important article of human subsistence. It is of all sizes, and has been known to weigh 60 or 70 lbs. It lives on small fish, particularly on crabs and others of the testaceous kind. It is a very voracious fish; and is so prolific that a million of eggs have been counted in a single roe. Its flesh is a high delicacy, particularly the sound or air-bladder, which is often used in the salted state. Off the coast of Cape Breton, Nova Scotia, and New England, and particularly on the great sand-bank off Newfoundland, this fish is found in inexhaustible abundance.

Galaxy, *milky-way*, in astronomy, that long white, luminous track, which seems to encompass the whole heaven, like a girdle. This, like every other phenomenon of nature, has supplied the poet with many a fantastic, and many a beautiful dream. The invention of the telescope has confirmed the conjecture of science, that it consists in a multitude of little stars, so remote as to be commingled by the naked eye.

Galenic, in medicine, that manner of proceeding in medicine which is founded upon the principles of Galen, or which that physician introduced.

Galenical *medicines*, those that are formed by the easier preparations of vegetables; as by infusion, or decoction, or by combining and multiplying ingredients; while the *chemical*, to which they are opposed, are those produced by extracting the more

intimate and remote virtues of the substances, through the means of fire and elaborate preparations; as calcination and digestion.

GALL, is a general word for acrid substances, and thus is used by St. Matthew for that mixture given to Jesus while on the cross, which St. Mark calls wine mingled with myrrh. It was a custom among the Greeks, Romans, and Jews, to give such bitter mixtures to those condemned to painful deaths, in order to benumb their senses.

GALL, in natural history, a protuberance or tumour produced by the puncture of insects, on plants and trees of various kinds, and of which a general idea will be formed from the account of the OAK-GALL.

GALL-BLADDER: is situated in the concave side of the liver, its use is to collect the bile, first secreted in the liver, and mixing it with its own peculiar produce to perfect it farther, to retain it together a certain time, and then expel it.

GALLEON, see REGISTER-*ship*.

GALLEY, a kind of low, flat-built vessel, furnished with one deck, and with sails and oars, and particularly useful in the Mediterranean.

GALLON, a measure of capacity both for dry and liquid things, containing four quarts; but these quarts, and consequently the gallon itself, are different, according to the quality of the thing measured: the wine gallon contains 231 cubical inches, and holds eight pounds averdupois of pure water: the beer and ale gallons contain 282 solid inches, and hold 10¼lbs. nearly; and the gallon for corn is equal to 272¼ cubic inches, and holds about nine pounds 13 ounces of pure water.

GALVANISM, see VOLTAISM.

GAMBOGE, a concrete vegetable juice, which forms an article of commerce at Cambaja, in the East-Indies, and which produces a most beautiful yellow colour. It has been employed to give colour to marble. As a medicine, it is a violent cathartic and emetic.

GAME, or wild quadrupeds and birds, which are taken by fowling or hunting.

GAME-LAWS, those laws by which the right of killing game is confined to persons who have received grants of a chace, a park, or a free-warren. The natural law in this behalf would be that every man should take such game as he may find on the ground he occupies.

The two best arguments by which a municipal law to the contrary can be defended, are probably these: 1. As a precaution of policy, it has the effect of disarming the body of the people. To this it is easily answered, it might be prohibited to take game by means of arms. 2. As a question of property, it may be said that, like the right of tythes, it is a reserved right, known to be claimed, and with which incumbrance the ground is let, bargains concluded, and rent estimated. It may be argued, that the virtual contract is, that the tenant of the grounds shall possess the crops he can rear upon them, but have no pretension to the game upon them, which is a gift of nature; and all this would be very fair, if the game were not actually fed out of the crops in question: a fact from which it follows, that those who are privileged to kill game, enjoy that privilege, generally speaking, at the charge of those who are not.

An higher consideration, however, even than this, would surely present itself to the mind of an enlightened lawgiver. It is the business of laws to prevent crimes, not to create them; but these laws create crimes, and are therefore at variance with the very principles of legislation.

GAMUT, or GAM-UT, in music, a scale whereby a learner is taught to sound the notes, *ut*, *re*, *mi*, *fa*, *sol*, *la*, in their several orders and dispositions.

Gam-ut is the first note in the scale.

GANTLET, *to throw the*, a proverbial phrase, signifying to challenge or defy. The expression derives its origin from the days of chivalry, when he that challenged an opponent in the lists threw down his glove, and he that accepted the challenge took it up.

The word *gantelet* is French, and comes from *gand* or *gant*, a glove. The gantlet was made of iron, and the fingers were covered with small plates. The gantelet itself was not in use before the thirteenth century.

GANTLOPE, *to run the*, a proverbial phrase, commonly expressed *to run the gantlet*, and signifying, primarily, a certain military punishment, and, figuratively, the passing through difficulties. According to the erroneous pronunciation, the hearer who compares this phrase with that which is the subject of the preceding article, is much at a loss what to understand by the word *gantlet*. The real words are these: "To run the Ghent-race." *Ghent*, is a well-known town in Flanders; and *loop*, in the Belgic, signifies a *race*. The gantlope, or Ghent-race, so called because invented at that

place, is this: in the land-service, when a soldier is to be punished in this manner, the regiment is drawn out in two ranks, facing each other, and each soldier having a switch in his hand, lashes the criminal as he runs along naked from the waist upward: in the navy, the whole ship's crew is disposed in two rows, standing face to face on both sides of the deck, so as to form a line whereby the delinquent may go forward on one side, and return aft on the other, and each seaman, being furnished with a small twisted cord, strikes him as he passes.

GAOL *delivery*. See ASSIZE.

GARNET, in natural history, a very beautiful gem, of a red colour, with an admixture of blue, and found in Bohemia. When free from blemishes, it is little inferior in colour to the oriental ruby, though only of a middle degree of hardness between the sapphire and the common crystal. It is found of various sizes, from that of a pin's head, to an inch in diameter.

GARTER, *order of the*, a military order of knighthood, said to have been first instituted by Richard the First, at the siege of St. John of Acre, where he caused twenty-six knights, who firmly stood by him, to wear thongs of blue leather about their legs. It is also understood to have been perfected by Edward the Third, and to have received some alterations, which were afterwards laid aside, from Edward the Sixth; but the number of knights remained as at first established, till the year 1786, when it was increased to thirty-two.

This order is never conferred but upon persons of the highest rank. The motto, *Honi soit qui mal y*

*pense*, is by some interpreted, "Shame to him that thinks evil hereof," and said to allude to the enterprize of Edward for obtaining the kingdom of France; while others translate it "Evil to him that evil thinks," and tell us, that with these words Edward, at a ball, presented to the countess of Salisbury her garter, which had happened to fall. In the spirit of the times, it is added, this incident laid the foundation of the order. If mere conjecture may be ventured on the subject, it is possible that the order was already in being, and that the king, with a happy presence of mind, quoted its motto. When the knights do not wear their robes, they are to have a silver star on their left side; and they frequently wear a piece of jewelry, representing St. George, dependent on a blue ribbon, crossing the body from the left shoulder. They are not to appear abroad without the garter, which is the most important part of their habiliments, on penalty of 6*s*. 8*d*. to be paid to the register of the order. Their college is within the chapel of St. George, in the castle of Windsor.

Gas, a general term employed in chemistry to express all those aerial fluids, whether produced by chemical experiments, or evolved in natural processes, which are not condensible by the cold of our atmosphere, and which differ from the air of the atmosphere. The term gas does not include those aerial substances which arise from water, ether, &c. on the application of heat, because they are readily condensed into their respective fluids again, by a certain reduction of temperature, whereas the gases retain their elasticity in every variation of

substances. Glue is gelatin in a state of impurity. When pure, it has neither taste nor smell. It forms a copious white precipitate with tan, which is brittle and insoluble in water, and is not changed by exposure to the air. It is a principal part both of the solid and fluid parts of animals.

GEM, in the natural history of fossils, a common name for all precious stones, of which there are two classes, the pellucid, and semi-pellucid.

1. The pellucid gems are compound bodies, extremely hard, and of great lustre.

2. The semi-pellucid gems are composed of chrystalline matter, slightly debased with earth.

The knowledge of gems depends on observing their hardness and colour. Their hardness is commonly allowed to stand in the following order: the diamond the hardest of all; then the ruby, sapphire, jacinth, emerald, amethyst, garnet, carneol, chalcedony, onyx, jasper, agate, porphyry, and marble. This difference, however, frequently varies.

In point of colour, the diamond is valued for its transparency, the ruby for its purple, the sapphire for its blue, the emerald for its green, the jacinth for its orange, the amethyst-carneol for its carnation, the onyx for its tawny, the jasper, agate, and porphyry, for their vermilion, green, and variegated tints.

All these gems are sometimes found coloured and spotted, and sometimes limped and colourless; in which case, they are known from each other by degree of hardness.

The semi-pellucid gems are frequently mentioned, on account of the figures, portraits, and

emblems engraved on them, in both ancient and modern times.

GENDARMES, or GENS D'ARMES, in the history of France, the denomination given to a select body of horse, on account of their succeeding the ancient gendarmes, who were completely clothed in armour. These troops were commanded by captain-lieutenants, the king and the princes of the blood being their captains.

GENDER, in grammar, a division of nouns or names, according as they belong to one of the two sexes, or to neither. It has happened, however, that a variety of words have been classed as masculine or feminine, for no reason whatever. The English language has very few terminations by which the genders are distinguished, such as *count* and *countess*, but generally supplies distinct words; as *boy*, *girl;* whereas, in the Latin and French, the terminations always mark the distinction, as *bonus equus*, a good horse; *bona equa*, a good mare; *un bon citoyen*, a good citizen; *une bonne citoyenne*, a good female citizen.

GENERAL, in military economy, one who commands in chief.

GENERAL, *Adjutant*, one who attends the general, assists in council, and carries the general's orders to the army.

GENERAL, *Lieutenant*, the next in rank after the general, and often employed to command in chief.

GENERAL, *Major*, the next officer to the lieutenant-general.

GENERALE, a particular beat of the drum, which gives notice for the infantry to be in readiness to march.

GENERALISSIMO, called also captain-general, and simply general, an officer who commands all the military powers of a nation; who gives orders to all other general officers; and receives none himself but from the king. The word was invented by cardinal Richelieu, as a title for himself, upon his going to command the French army in Italy.

GENEVA, or GIN (corrupted from *genièvre*, juniper,) in commerce, an ordinary malt spirit, distilled a second time, with the addition of juniper-berries. It is said that oil of turpentine supplies the place of juniper, among modern distillers.

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